

THE SCIENTIFIC APPROACH TO BUILDING MUSCLE, LOSING FAT,  
ENHANCING PERFORMANCE, AND STAYING HEALTHY

VOLUME 13, NUMBER 3

# FITNESSRX

YOUR ULTIMATE PRESCRIPTION FOR THE PERFECT BODY

**SUMMER  
SPECIAL!**

**LEAN &  
RIPPED**

FITNESSRX FOR MEN

**8**

**WEEK  
TOTAL  
BODY**

**TRAINING  
& DIET PLAN**

**-BIGGER  
-STRONGER  
-MORE POWERFUL**

**+BOOST**

**TESTOSTERONE!**

**GET  
YOUR  
SUMMER  
6-PACK  
NOW!**

MAY 2015





# Lipodrene®

DIETARY SUPPLEMENT



**THE WORLD'S MOST ADVANCED WEIGHT LOSS AID  
EVER DEVELOPED WITH RAPID RELEASE TECHNOLOGY!†**  
**Revolutionary Diet Aid for Energy and Weight Loss!†**

- Over 1 Billion Dosages Sold and #1 Ephedra Product Available!†
- Hardcore Stimulants for an Eye-Opening Blast of Energy,  
Including 25mg Ephedra Extract & 1,3 Dimethylamylamine (DMAA)†



**25MG  
EPHEDRA  
EXTRACT**

**www.hitechpharma.com • For more information, please call 1.888.855.7919.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, diagnose, or prevent any disease. This product should not be used in place of or as a substitute for recommendations by your healthcare professional. No clinical study has been performed on Lipodrene® Hardcore. These statements are based upon the active ingredients: Ephedra Extract, Acacia Rigidula, Theobromine, Yohimbe, Citrus aurantium, Caffeine, Green tea, 1,3 Dimethylamine HCl, 5-methoxytryptamine and Phenylethylamine. WARNING: this product can raise your blood pressure and interfere with other drugs you may be taking. Talk to your doctor about this product.



Dietary Supplement

# Black Widow®

## Xtreme Energizer!†



Black Widow® is the newest stimulant product from Hi-Tech Pharmaceuticals (the leader in diet and energy pills). Black Widow™ contains **25mg Thermo-Z™** brand ephedra extract and is designed for extreme energy for hardcore stimulant fans.

Black Widow® will set you on fire from the moment you take it, and will be all over you for hours! The "ECA" stack of the 90s is combined with Thermo-RX® (often called the ephedrine imposter) from Acacia rigidula. Black Widow® contains Thermo-Z™ brand ephedra (not banned in any state or by the FDA). If you want a good "kick in the ass" and want to feel great all day, then Black Widow® will not disappoint you. Black Widow® provides wicked energy and will have you coming back for more.

**25mg**  
**Extra Strength**  
**Ephedra Extract**



**www.hitechpharma.com • For more information, please call 1.888.855.7919.**

†These statements have not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, diagnose, or prevent any disease. This product should not be used in place of or as a substitute for recommendations by your healthcare professional. No clinical study has been performed on Black Widow®. These statements specifically are based upon the active ingredients: Ephedra, Caffeine, Acacia rigidula, Theobromine, and Yohimbe. WARNING: this product can raise blood pressure and interfere with other drugs you may be taking. Talk to your doctor about this product.



# REVOLUTIONIZING THE SPORTS NUTRITION INDUSTRY FOR OVER 20 YEARS

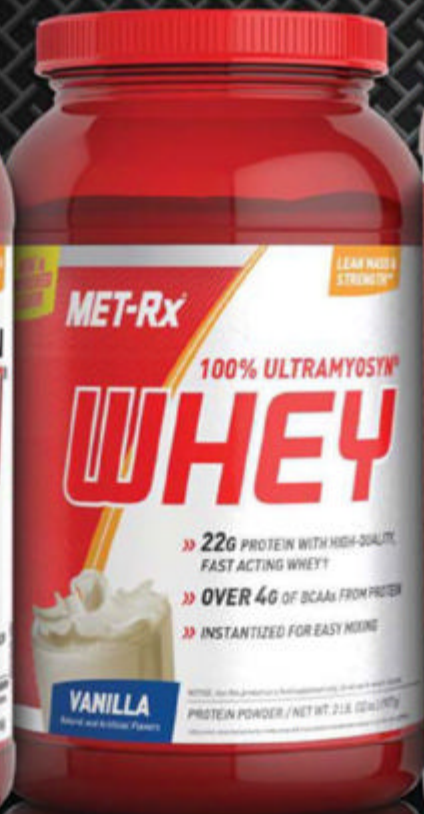
## MET-Rx®

### 100% ULTRAMYOSYN® WHEY

- 22g Protein
  - Over 4g of BCAAs from Protein
  - 120 Calories
  - 3g Carbs
- 2lb. & 5lb. sizes available

### PROTEIN REVOLUTION®

- 30g Protein<sup>Δ</sup>
  - 270 Calories<sup>Δ</sup>
  - 22g Carbs<sup>Δ</sup>
    - 4 Carb Blend with Waxy Maize
  - Neuro-Energy Blend
- 2.5lb. size only



# BECAUSE YOU JUST CAN'T FAKE



## ULTRAMYOSYN WHEY ISOLATE

- 30g Protein
- Over 5g of BCAAs from Protein
- 130 Calories
- 1g Carbs

2lb. & 5lb. sizes available

## 100% MICELLAR CASEIN

- 25g Protein
- Over 4g of BCAAs from Protein
- 120 Calories
- 5g Carbs

2lb. size only

## XTREME SIZE UP®

- 60g Protein<sup>Δ</sup>
- 3g Creatine<sup>Δ</sup>
- 79g Energizing Carbs<sup>Δ</sup>
- 3g Glutamine<sup>Δ</sup>
- 580 Calories<sup>Δ</sup>

6lb. size only



ΔPer 2 scoop serving. <sup>Δ</sup>Per 4 scoop serving. ©2015 MET-Rx® USA, Inc. 14-M7-1212-eax

\*\*Use in conjunction with an intense daily exercise program and a balanced diet including an adequate caloric intake. †22g protein comprised primarily of whey along with trace amounts of protein which naturally occur within other ingredients.

\*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.

# STRONG.





# THE CHAMPION'S CHOICE!

*"I vowed to never get out-muscled in the cage after my last loss three years ago. I knew I had to get bigger and stronger in order to win the MMA World Championship."*

— Fabricio Werdum  
MMA Champion, MHP Athlete

## THE MAKING OF A CHAMPION

After suffering a controversial defeat to Alistair Overeem in 2011, heavyweight fighter Fabricio Werdum vowed that he would never lose another MMA bout to a more powerful fighter. Fabricio approached his strength coach and said, "I'll do whatever it takes to get stronger. I will never let that happen again." His strength coach immediately put Fabricio on an advanced resistance training program and contacted his friend, nutrition expert and MHP CEO Gerard Dente, about starting Fabricio on a customized MHP supplement program to enhance his strength and recovery.

Since partnering with MHP, Fabricio's training and supplement program has paid huge dividends. Over the past three years, Fabricio has been undefeated in the cage, rattling off five straight victories, including his latest win over Mark Hunt with a convincing TKO to earn the Heavyweight World Championship!

*"Working with Fabricio and watching his ascent to the MMA World Championship has been a tremendous experience. He worked extremely hard for this and I'm just glad to be a part of it."*

— Gerard Dente, MHP CEO

What makes Fabricio Werdum so dangerous is he's one of the most focused and dedicated athletes you will ever meet. He will out-train, out-work and outlast his opponents. A typical day for Fabricio starts with Brazilian jiu jitsu, Muay Thai and grappling training. This two hour intense workout stresses his body so he builds muscular endurance and is able to concentrate on devastating technique even while exhausted. He will train with multiple partners so he never gets a chance to relax or lose intensity. After such a session, his MHP supplements speed his recovery so he's able to return to the gym a few hours later for



**FABRICIO WERDUM**  
KING OF THE CAGE

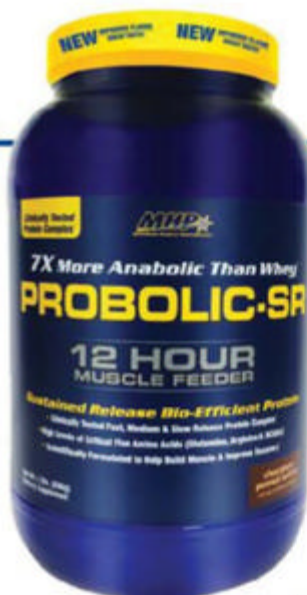
hardcore MMA training. Here he combines all disciplines with striking, kicking and endurance drills to prepare himself for the rigors of ultimate fighting competitions. In the evening, he coaches classes at his own MMA gym, working with his students through their workouts. On alternating days, he includes weight lifting, bodyweight training and extreme exercises such as battle ropes and sled pushes. These sessions are designed to maximize his power, strength and explosiveness, which translate well into his MMA training. Here again, recovery is key to performing high intensity workouts 2-3 times a day, day after day.

*"I would never be able to maintain my level of training intensity and frequency without the proper supplementation. There is just no way my body would be able to handle it and recover."*

— Fabricio Werdum



As Fabricio will attest, MHP supplements have played a major role in his rise to win an MMA World Championship. At the cornerstone of Fabricio's supplement regimen are MHP's superior anabolic protein blend, **PROBOLIC-SR**, and its post-workout recovery solution, **DARK MATTER**.



## PROBOLIC-SR PROTEIN – 7X MORE ANABOLIC THAN WHEY!

Protein is the most essential nutrient for an athlete to achieve his goal of muscularity, strength and maximum performance. This is why MHP's clinically researched protein blend supplement is such a critical component of Fabricio's regimen. PROBOLIC-SR's advanced protein blend of fast, medium and slow release proteins has been shown in clinical studies to be superior to whey for muscle building and recovery. In fact, a recent clinical study showed that the blend of proteins found in PROBOLIC-SR was a whopping 7X more anabolic than whey protein for post-workout muscle building! To enhance its already powerful properties, PROBOLIC-SR also contains a patented Sustained Release Micro-Feed Technology that extends the release of muscle building amino acids for up to 12 hours. If you are looking for winning results, PROBOLIC-SR is the gym tested and research proven protein... Test it out for yourself.

## DARK MATTER POST-WORKOUT MUSCLE BUILDING & RECOVERY

As an athlete who trains multiple times during the week, Fabricio needs his body to recover rapidly between training sessions. There is no better way to optimize muscle building and recovery than with precise post-workout nutrition. As a result, MHP put Fabricio on DARK MATTER, its revolutionary post-workout solution. DARK MATTER provides the powerful nutritional tools you need to stimulate post-workout muscle growth and recovery by creating the ideal anabolic response. Within minutes of taking DARK MATTER, your insulin levels simultaneously peak with amino acids, creatine and carbohydrates to transport nutrients into muscle tissue during the critical window of opportunity that follows your workout. To get the most out of your training, drink DARK MATTER immediately after every workout and introduce your muscles to a new frontier of hyper-growth and recovery!

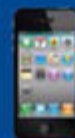


## CHECK OUT FABRICIO'S "DAY IN THE LIFE" VIDEO

If you want to learn more about Fabricio's training and supplementation, or to see a video of what a day in the champ's life is like, visit:

<http://mhpstrong.com/portfolio/fabricio-werdum/>

**TO ACCESS THE VIDEO,  
USE THE QR CODE!**



**1.888.783.8844 • MHPSTRONG.com**

GNC  
LIVE WELL

Vitamin  
Shopper  
every body needs

B  
BIO-TECHNICAL

VITAMIN  
WORLD

Isolyt  
Vitamin

Join  
Team MHP!



facebook.com/TeamMHP  
twitter: @MHPstrong  
instagram: mhpstrong

**MHP**  
MAXIMUM HUMAN PERFORMANCE

© 2015 Maximum Human Performance, LLC. All rights reserved. These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, cure, treat or prevent any disease. Your results may vary. Not intended for use by those with a medical condition. Use only as directed. Do not exceed recommended daily intake. Not intended for use by persons under age 18.



# SADIK HADZOVIC

TeamGAT Athlete  
IFBB Physique Pro

Follow Sadik:  
**TeamGAT.com**

"I stand firmly behind our  
unconditional 30-day money-back  
guarantee on all our products.  
Stay strong!"

*Charles Moser*  
Charles Moser  
PRESIDENT & CEO





# LEAN PHYSIQUE

## MUSCLE MARTINI® & SUPERTEIN® ARE YOUR PERFECT TRAINING & RECOVERY REGIMEN!

Physique perfection takes dedication to protecting your lean muscle. Proper amino support is crucial. Muscle Martini® is the ultimate amino superdrink, loaded with aminos and antioxidants. And, it's so tasty. Delicious Supertein® is ideal recovery and repair with high quality multi-protein goodness. Put quality in, get a quality physique out. Save \$5. each at The Vitamin Shoppe.



# Save \$5

Limited time offer! Save \$5 each on Muscle Martini & Supertein now at The Vitamin Shoppe (in-store & online)!

Offer good 4/1-4/30/15

 theVitamin Shoppe®  
every body matters™

  
#COMPETE HARDER





# GET LEAN AND RIPPED! *for Summer*

**Summer is just around the corner, but there is still time to get in shape for the warmer weather.** In order to achieve this goal, you will need the most effective, scientifically backed methods and workouts to get leaner, stronger and more powerful— *fast*. That's why this issue of FitnessRx for Men is all about getting lean and ripped in time for summer, utilizing some of the most cutting-edge research to help you achieve a transformation in the least amount of time.

Our cover model Steve Cook is one of the top competitors in the NPC's Men's Physique division. From the start he was a natural, and earned his pro card at just his third contest. In "Get Jacked and Shredded with Steve Cook" by Allan Donnelly on page 40, Steve shares some of his training and workout advice, explaining how he's been able to build and maintain a functional, athletic physique. Steve is known for his V-taper, with his large shoulders and small waist. Using a combination of compound and isolation movements, Steve trains six days a week, training at least two muscle groups in each workout. With Steve's tips and workouts, you'll be able to build the ultimate X-frame in time for summer.

In "Get Ripped in 8 Weeks! Gain Muscle and Lose Fat: Complete Training and Nutrition Program" on page 56, Thomas Fahey, Ed.D. explains how to get into your best shape by using the latest research behind high-intensity explosive training (HIET). This method works because research has shown that it can increase muscle mass and strength at a fast rate. Combine this with high-intensity interval training and you'll really boost muscle growth while blasting fat in time for summer. This is a training program that will produce results— so get ready to work!

Jeremy Buendia, the 2014 Mr. Olympia Physique Champion, has a small waist and V-taper that helps set him apart onstage, but what really puts him over the top is his chest. And to fulfill his next goal— defend his title and become the Men's Physique division's first two-time Olympia champion— he admits that one area he'll need to improve is his back. In "Superset Back and Chest Workout with 2014 Mr. Olympia Physique Champ Jeremy Buendia" by Allan Donnelly on page 50, take a look at the two priority areas that will remain a focus for Buendia, as well as his approach for improving and training to remain at the top of the Men's Physique division.

Many people may dismiss plyometric training as solely for athletes. But plyometric training has the ability to increase muscle size and strength, especially when it's used in conjunction with weight training. In fact, plyometrics can be used to train most body parts, including the upper body. In "Explosive Plyometric Training: Get Bigger, Stronger and More Powerful," by Michael J. Rudolph, Ph.D. on page 64, read about the science behind this effective form of training and why you should be including it in your program if you want to get in shape fast.

There are tons of fat-loss supplements out and it can be tough to know which ones to choose. To help in your effort to get lean for summer, check out "Fat-Loss Supplements: What Works and What Doesn't" by Victor Prisk on page 70.

New research suggests time-restricted feeding, which confines food intake to an eight- to nine-hour period, may protect you from gaining weight and compromising your health. In "Get a Tight Midsection: Insulin and Abdominal Fat" by Marie Spano, MS, RD, CSCS, CSSD on page 76, find out the latest research on feeding time and bodyweight so that you can blast that extra stubborn fat in time for summer.

Chronic low-grade inflammation can also have a negative effect on body fat, and is also the underlying cause of autoimmune diseases. In "The Anti-inflammatory Diet: Lose Your Gut and Stay Healthy Forever" by Marie Spano, MS, RD, CSCS, CSSD on page 92, discover the methods and foods that reduce inflammation so that you can burn fat while improving your health.

Many people perform cardio after an overnight fast because they believe it's the best method for fat loss. Is this something you should be doing in order to get in shape by summer, or is this method ineffective? Find out in "Does Fasted Cardio Maximize Fat Loss?" by Brad Schoenfeld, Ph.D., CSCS, FNSCA on page 74.

The rest of the issue is packed with the latest scientifically backed research to help you get blast fat and get bigger, stronger and more powerful in time for summer. Check out our workouts, advice and tips, to get in your best shape now! And for more, don't forget to check out our website, [www.fitnessrxformen.com](http://www.fitnessrxformen.com).

[www.fitnessrxformen.com](http://www.fitnessrxformen.com)

FOR MEN  
**FITNESSRx**<sup>TM</sup>  
YOUR ULTIMATE PRESCRIPTION FOR THE PERFECT BODY

#### Publishers

Steve & Elyse Blechman

#### Editor-In-Chief

Steve Blechman

#### Online Editor

Allan Donnelly

#### Creative Director

Alan Dittrich, Jr.

#### Digital Creative Director/

Design Consultant

Chris Hobrecker

#### Managing Editor

Lisa Steuer

#### Associate Editor

Alan Golnick

#### Associate Art Director

Stephen Kolbasuk

#### Contributing Editors

Dan Gwartney, MD

Thomas Fahey, EdD

Victor Prisk, MD

Stephen E. Alway, Ph.D., F.A.C.S.M.

#### Contributing Illustrator

William P. Hamilton, CMI

#### Chief Photographer

Gregory James

#### Media Producer

Jessica Colley

#### Advertising Director

Angela Theresa Frizalone

(239) 495-6899

#### Director of New Business Development

Todd Hughes

416-346-3456

#### Administrative Assistant

Fernanda Machado

#### Circulation Consultants

Irwin Billman and Ralph Pericelli

#### Reader Inquiries:

Subscriptions (to order)

(631) 751-9696 (ext 301)

Visit us at:  
[www.fitnessrxformen.com](http://www.fitnessrxformen.com)

#### FITNESS RX for Men (ISSN 1543-8406)

is published six times a year by Advanced Research Media, 21 Bennetts Road, Suite 101, Setauket, New York, 11733. Copyright ©2008 by Advanced Research Media. All rights reserved. Copyright under the Universal Copyright Convention and the International Copyright Convention. Copyright reserved under the Pan Am Copyright. Rate: \$20.95 per year (USA); \$38.95 per two years (USA); foreign: \$28.99 per year. Nothing appearing in FITNESS RX may be reprinted, either wholly or in part, without the written consent of the publisher. Send editorial submissions to: FITNESS RX, 21 Bennetts Road, Suite 101, Setauket, New York, 11733. Stamped, self-addressed envelope must accompany all submissions, and no responsibility can be assumed for unsolicited submissions. All letters, photos, manuscripts, etc. sent to FITNESS RX will be considered as intended for publication, and FITNESS RX reserves the right to edit and/or comment. Periodical postage paid at Setauket P.O., Setauket, NY 11733 and at Glasgow, KY 42024. Postmaster: Send address changes to FITNESS RX, 21 Bennetts Rd., Suite 101 Setauket, NY 11733. Advertising Office Phone: (800) 653-1151. PRINTED IN USA





**NEW  
FORMULA!**

# THE NEXT EVOLUTION IN WEIGHT LOSS



Experience an evolution in intense sensory with the all-new **HYDROXYCUT HARDCORE® NEXT GEN!** Tackle your most demanding workouts with a formula that will stand up to anything you've ever tried. It's fortified with a precise dose of ultra-potent caffeine anhydrous to enhance focus, and the power of green coffee to support real weight loss results. It's even packed with a never-before-seen combination of hot ingredients like *Scutellaria*, *Coleus* and yohimbe for an unparalleled sensory experience. For the results you crave, get a trusted name in weight loss – get **HYDROXYCUT HARDCORE® NEXT GEN** from MuscleTech®.

    **MUSCLETECH.COM**

## NEW FORMULA NOW FEATURING:

### **290MG** CAFFEINE

With more ultra-pure caffeine anhydrous than the previous formula, you get extreme energy for maximum training intensity and thermogenesis, plus increased mental focus after just one dose.

### **75MG** SCUTELLARIA

From the species *Scutellaria*, an herb from the mint family that supplies compounds such as flavonoids, and contributes to the overall sensory experience when combined with caffeine.

### **145MG** COLEUS, QUAYUSA & OPHIOPOCON

A potent, never-before-seen combination of in-demand ingredients that works to deliver an unmatched sensory experience for ultimate intensity.

### **400MG** GREEN COFFEE

Delivers 400mg green coffee bean extract, including 200mg of standardized green coffee supplying 45% chlorogenic acids, which has been scientifically shown to help study subjects lose 10.95 lbs. in 60 days with a low-calorie diet, and 3.7 lbs. in 8 weeks with a low-calorie diet and moderate exercise.





**FOR MEN**

THE **SCIENTIFIC APPROACH** TO BUILDING MUSCLE,  
LOSING FAT, ENHANCING PERFORMANCE AND STAYING HEALTHY

# FITNESSRx<sup>TM</sup>

YOUR COMPLETE PRESCRIPTION FOR THE PERFECT BODY

VOL. 13 | NUMBER 3 | MAY 2015

## FEATURES



### 50 SUPERSET BACK & CHEST WORKOUT

With 2014 Mr. Olympia  
Physique Champ Jeremy Buendia  
By Allan Donnelly



### 56 GET RIPPED IN 8 WEEKS!

A Scientific Approach!  
Gain Muscle and Lose Fat: Complete  
Training and Nutrition Program  
By Thomas Fahey, Ed.D.



### 40 GET JACKED AND SHREDDED WITH STEVE COOK

Build the Ultimate X-frame  
By Allan Donnelly



### 64 EXPLOSIVE

### PLYOMETRIC TRAINING

Get Bigger, Stronger and More Powerful  
By Michael J. Rudolph, Ph.D.





50

**SUPERSET BACK AND CHEST WORKOUT**



64

**EXPLOSIVE PLYOMETRIC TRAINING**



56

**GET RIPPED IN 8 WEEKS!**

## IN THIS ISSUE

### 10 PUBLISHER'S LETTER

By Steve Blechman

### 14 MAIL ROOM

Keep Those Letters Coming

### 16 ONLINE NOW!

At [Fitnessrxformen.com](http://Fitnessrxformen.com)



**70 FAT-LOSS SUPPLEMENTS: WHAT WORKS AND WHAT DOESN'T**

## WARM UP

### CUTTING-EDGE RESEARCH

By Steve Blechman and Thomas Fahey, Ed.D.

### 20 TRAINING

### 24 NUTRITION

### 28 FAT LOSS

### 30 HEALTH

### 32 SUPPLEMENTS

### 36 SEX



**CUTTING-EDGE RESEARCH!**

## COOL DOWN

### 70 FAT ATTACK

**Fat-Loss Supplements: What Works and What Doesn't**  
By Victor R. Prisk, M.D.

### 74 CARDIO BURN

**Does Fasted Cardio Maximize Fat Loss?**  
By Brad Schoenfeld, Ph.D., CSCS, FNCSA

### 76 HARD 'CORE' TRAINING

**Get a Tight Midsection: Insulin and Abdominal Fat**  
By Marie Spano, MS, RD, CSCS, CSSD

### 80 MUSCLE FORM +FUNCTION

**Close-grip Pull-ups: Old-school Training for New-world Results**  
By Stephen E. Alway, Ph.D., F.A.C.S.M.  
Illustrations by William P. Hamilton, CMI

### 84 CROSSFIT REVOLUTION

By J.C. Herz

### 86 TRAIN WITH THE PRES

By Cory Gregory

### 88 SUPPLEMENT EDGE

**Thermo Heat Multi: Advanced Metabolic Function and Health**  
By Michael J. Rudolph, Ph.D.

### 92 MEN'S HEALTH

**The Anti-inflammatory Diet: Lose Your Gut and Stay Healthy Forever**  
By Marie Spano, MS, RD, CSCS, CSSD

### 94 ULTIMATE IN NUTRITION

**Glutamine Dilemma: Immune Enhancer? mTOR Antagonist?**  
By Michael J. Rudolph, Ph.D.

### 98 GET FIT WITH PLITT

By Team FitRx







For me, sometimes I need to be told what not to do while training, so I really appreciated the 21 training rules ["21 Training Rules You Must Not Break," March 2015]. It helped me to realize the mistakes I'm making in the weight room and the pain I shouldn't be ignoring. By putting all of this of advice into place like, "Don't train like a powerlifter," and "Don't favor strong body parts," I've learned that it's not productive to keep pushing myself past my limits just to make strength gains. In reality, I will probably get stronger by consistently using correct form and forgetting about the weight until I can handle it. Thanks FitnessRx for Men.

Jake Stutio  
Email

## RIPPED TO SHREDS ABS WORKOUT

Thank you for featuring Diego Sebastian's routine in the abs workout ["Carve Up Your Midsection with Diego Sebastian's Complete Routine: Ripped To Shreds Abs Workout," March 2015]. Dude has some shredded abs and I can't say that I would hate to look like that one day. I've done his workout for the last two weeks and I'm already seeing incredible results in my core and great definition. I'm also working on improving my mind-muscle connection that Sebastian talks

about establishing. I realized over the years that I haven't been training abs as intensely and focused as I have other body parts, and that was one of the main reasons why they ended up lagging. I'm excited to see the results over the next few months and hopefully I'll have washboard abs by the summer.

Mike Trent  
Email



## 8-WEEK ARM ASSAULT

After slacking over the winter, I really needed a program to bring my arms up to par for spring. I'm currently doing Joe Donnelly's workout ["8-Week Arm Assault: Kick Your Arm Growth Into Overdrive With Joe Donnelly's Killer Program," March 2015] and I'm starting to see awesome growth. I've been taking Donnelly's advice about holding the tension and slowing down my reps and let me tell you, my arms are bigger than they've ever been. Thanks, FitnessRx.

Nasim Faruq  
Email



## 100-DAY SQUAT CHALLENGE

When I saw Cory Gregory taking a 100-day squat challenge ["100-Day Squat Challenge: Are You Man Enough?" March 2015], I really thought he was crazy: I mean, who can do squats for 100 days straight? I know I couldn't. Even through my shock I read on: the story turned out to be a compelling quest for mental strength and it inspired me to push past my own limits in the gym. Thanks!

Brody Ruggiero, Email



## GREG PLITT *Will Be Missed*

This man is an inspiration to me. I never met him in person, but I bought every magazine I could find that featured him, and watched his YouTube videos. I was saddened to hear of his passing, hoping that it was one of those Internet hoaxes. Unfortunately that is not the case. My condolences to his family, friends and colleagues.

David  
Email

FOR MEN  
**FITNESSRx**  
YOUR ULTIMATE PRESCRIPTION FOR THE PERFECT BODY  
WWW.FITNESSRXFORMEN.COM

Send us your comments!  
editor@fitnessrxmag.com or  
Advanced Research Media  
21 Bennetts Road, Suite 101  
East Setauket, NY 11733



# SOMETIMES WHAT'S NOT IN YOUR SPORTS NUTRITION IS JUST AS IMPORTANT AS WHAT IS.

For those who set the bar a little higher, Twinlab CleanSeries formulas are Non-GMO\*\* and banned substance tested, NSF Tested & Certified, and contain no artificial flavors, colors, sweeteners or preservatives.



CleanSeries Tested & Certified

## #TEAMCLEAN



## TWINLAB®

## CLEANSERIES™

Learn more at [twinlab.com/cleanseries](http://twinlab.com/cleanseries) Join us on Facebook

©2015 Twinlab Corporation. All Rights Reserved.

\*\*Independently PCR (Polymerase Chain Reaction) tested by a third party lab for genetically modified DNA to a limit of 0.9%.



**NEW CONTENT DAILY!**

Get the latest training, nutrition and supplementation info from the experts at [FitnessRxForMen.com](http://FitnessRxForMen.com)!

**All-New EXCLUSIVE VIDEOS!**

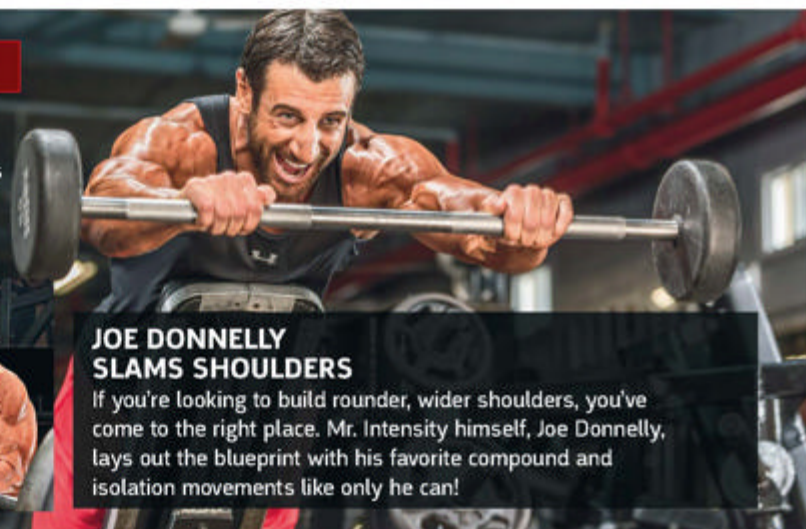
**KILL IT LIKE KYLE**

Former U.S. Army Captain and fitness model Kyle Clark takes you through some of his top workouts and exercises in this exclusive video series!



**JOE DONNELLY SLAMS SHOULDERS**

If you're looking to build rounder, wider shoulders, you've come to the right place. Mr. Intensity himself, Joe Donnelly, lays out the blueprint with his favorite compound and isolation movements like only he can!



**ARTICLES**

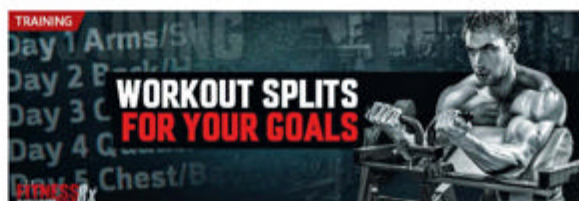


**6 WAYS TO MAXIMIZE THE MIND-MUSCLE CONNECTION**

The mind-muscle connection can make all the difference in the world when it comes to stimulating growth and detailing quality muscle. Try these six tips to get the most out of your next workout.

**WORKOUT SPLITS FOR YOUR GOALS**

Designing your own workout split can be as complex as building your own spaceship. Fortunately, it doesn't have to be that hard. Find out how to lay out your schedule to make sure you reach your goals.



**EAT FOR LEAN MUSCLE GAINS**

Getting quality lean-muscle gains can be a challenge if you're not sure how to go about it— you can't just eat anything! If you're not careful, you could end up packing on too much fat and not enough lean muscle. Here are four tips to make sure you're doing it right.

**Also Featuring:**

- > Train with the Prez Cory Gregory
- > Alex Carneiro's Weekly Training and Nutrition Tips
- > And much more!

Be sure to visit [www.fitnessrxformen.com](http://www.fitnessrxformen.com) every day and also our four social media sites:



**TWITTER:**  
@FitnessRxforMen



**FACEBOOK:**  
FitnessRxforMen



**INSTAGRAM:**  
@FitnessRxForMen



**PINTEREST:**  
fitnessrxmen







PRESENTS

NEW



# THE MOST REVOLUTIONARY PREWORKOUT & POSTWORKOUT EVER DEVELOPED.

FOR WHOLESALE  
INQUIRIES PLEASE  
CONTACT EUROPA SPORTS



**FOR FREE SHIPPING**

GO TO OUR STORE AT [ADVANCEDMOLECULARLABS.COM](http://ADVANCEDMOLECULARLABS.COM),  
AND USE COUPON CODE "RXMEN0415" AT CHECKOUT

SCIENCE > INNOVATION > RESULTS

Copyright © 2015 Advanced Molecular Labs.  
All rights reserved.

\*These Statements have not been evaluated by the Food and Drug Administration.  
This product is not intended to diagnose, treat, cure, or prevent any disease.



# FitRx WARM UP

● THE LATEST NEWS AND RESEARCH FROM THE WORLD OF FITNESS



23

## TRAINING

Front Squats Stress the Spine Less Than Back Squats

## IN THIS SECTION

### 20-23 TRAINING

FRONT SQUATS STRESS THE SPINE LESS THAN BACK SQUATS; IS FIVE SETS BEST FOR WEIGHT-TRAINING PROGRAMS?

### 24-26 NUTRITION

HIGH DAIRY FOOD INTAKE INCREASES THE RISK OF PROSTATE CANCER; WHOLE GRAINS LINKED TO FEWER HEART DISEASE DEATHS

### 28-29 FAT LOSS

CHILI INGREDIENT IS AN EFFECTIVE FAT FIGHTER; ADEQUATE SLEEP PREVENTS OBESITY

### 30-31 HEALTH

SCIENTISTS GROW HUMAN MUSCLE IN A DISH; PERSONALITY LINKED TO HEALTH

### 32-34 SUPPLEMENTS

CITRULLINE PROMOTES ABDOMINAL FAT LOSS; TYROSINE INCREASES MENTAL FUNCTION DURING HEAT EXPOSURE

### 36-38 SEX

POOR BLOOD SUGAR CONTROL LINKED TO PREMATURE EJACULATION; WHAT GOOGLE TELLS US ABOUT SEX

SHUTTERSTOCK



# UNRIVALED SENSORY OVERLOAD

## UNLIKE ANYTHING YOU'VE EVER TRIED

**THE MOST HARDCORE WEIGHT LOSS  
& ULTIMATE SENSORY EXPERIENCE**

New **Hydroxycut® SX-7® Black Onyx™** is the most hardcore and cutting-edge formula on the market today. Super-charged with 7 premium ingredients in a never-before-seen combination, this formula is designed for extreme energy and mental focus. It also delivers hardcore weight loss with green coffee, shown to help study subjects lose 10.95 lbs. in 60 days with a low-calorie diet, and 3.7 lbs. in 8 weeks with a calorie-reduced diet and moderate exercise. With **Hydroxycut® SX-7® Black Onyx™**, just one dose delivers an unrivaled sensory overload unlike anything you've ever tried!

- Features 7 super-extreme, cutting-edge ingredients
- Delivers hardcore weight loss
- Contains caffeine anhydrous for extreme energy
- With *Coleus*, *Salvia* & theanine for a powerful sensory experience!

**NEW**  
MAXIMUM-STRENGTH  
SENSORY FORMULA



Facebook logo is owned by Facebook Inc. Read the entire label and follow directions. © 2015

[GNCLIVELL.COM/HYDROXYCUTSX7](http://GNCLIVELL.COM/HYDROXYCUTSX7)



EXCLUSIVELY AT

**GNC**  
LIVE WELL



## INCORPORATE ECCENTRIC CONTRACTIONS IN YOUR WORKOUTS

Muscles exert force concentrically as they shorten and eccentrically as they lengthen. Jonathan Mike from the University of New Mexico, and co-workers, described the benefits of eccentric contractions for building muscle size and strength. Muscles can exert more force during eccentric than concentric contractions, which stimulates greater degrees of muscle hypertrophy. Also, muscle activation and tension is greater during high-speed eccentric contractions than slow contractions.

Athletes typically incorporate eccentric training without even knowing it: their muscles contract (eccentrically) when they lower the weight during bench presses, squats and curls. They could incorporate eccentrics further by increased emphasis on the down portion of the lift. For example, using a power rack, they could do heavy singles on the down portions of bench presses and squats using more weight than their one-repetition maximum. During kettlebell swings, a partner could increase the eccentric part of the exercise by pushing on the kettlebell during the down portion of the exercise.

People have long used negatives to accentuate the force used in eccentric contractions. Have a spotter help you during the concentric phase of the lift, and lower the weight by yourself during the eccentric phase. As discussed, do eccentric exercises at high speeds for the greatest load. (Strength and Conditioning Journal 37, (1): 5-17, 2015)



## CALORIC EXPENDITURE DURING HIIT GREATER THAN AEROBICS OR STRENGTH TRAINING



High-intensity interval training (HIIT) can build fitness remarkably quickly. Studies of HIIT on stationary bikes found fitness gains in two weeks that normally took six months. Paul Falcone from MusclePharm Sports Science Institute in Denver, and colleagues, found that caloric expenditure was greater during HIIT performed on a hydraulic weight machine, compared to workouts of equal duration involving either endurance training or strength training. The HIIT program involved repeated intervals on a hydraulic weight machine for 20 minutes at maximum effort, followed by 40 seconds of rest. All of the training sessions were 30 minutes in length. HIIT resistance training programs can build strength and endurance at the same time. (Journal Strength and Conditioning Research, published online January 2015)

## PROTECT YOUR BACK WHEN YOU TRAIN!

Spinal disks, muscles and nerves are extremely fragile and are subject to injury because of poor exercise mechanics, inadequate physical fitness and poor progression. Coach Randy Wheeler from Fisher High School in Indiana had some advice on how to get strong without hurting your back. Do exercises that stabilize the core (muscles supporting the spine) to improve fitness and prevent injury. Focus on proper technique when doing preventive exercises such as squats, deadlifts, cleans and snatches. The number one rule is to do no harm. For example, doing high-rep traditional sit-ups builds the abs, but eventually causes disk deterioration leading to back pain in the future. Preventive exercises should begin with bodyweight as the resistance, and progress when you feel no pain and you have good technique. Most people have poor technique when they do whole-body lifts such as squats and snatches. Learn to do these exercises correctly so that you don't hurt yourself. (Strength and Conditioning Journal, 37 (1): 18-23, 2015)

## ANABOLIC HORMONES RESPONSE GREATEST WHEN STRENGTH TRAINING FOLLOWS ENDURANCE TRAINING

Many people combine strength and endurance training to build muscle and cut fat. Which should you do first? A Portuguese study found that the anabolic hormone environment as measured by testosterone and IGF binding protein-3 was greatest when weight training followed endurance exercise. However, there are other considerations. Weight training increases arterial stiffness, which could cause long-term cardiovascular problems. Several studies have found that endurance training following weight training prevents arterial stiffness. At this time, people are advised to train the way they feel most comfortable. (Journal Strength Conditioning Research, 29: 74-79, 2015)



# IMMEDIATE 22.5% INCREASE IN STRENGTH

## THE MOST ADVANCED NON-STIMULANT PRE-WORKOUT STRENGTH ENHANCER!

**GAKIC® VO2 MAX SX-7®** helps you perform at your best during your toughest workouts without the need for creatine or stimulants. Test subjects using the same dose of *Terminalia arjuna* found in **GAKIC® VO2 MAX SX-7®** significantly increased VO2 max and absolute power in an 8-week study. This innovative formula also delivers immediate increases in strength and muscle endurance.

- An immediate 22.5% increase in strength<sup>1</sup>
- First-dose strength gains
- A 21% increase in muscle endurance
- Added *Terminalia* for significant VO2 MAX increase

### IMMEDIATE FIRST-DOSE STRENGTH GAINS



EXCLUSIVELY AT  
**GNC**  
LIVE WELL



Facebook logo is owned by Facebook Inc. Read the entire label and follow directions. © 2015

GNCLIVEWELL.COM/HYDROXYCUTSX7





# TRAIN INTENSE

## LESS EXPENSE



Body Fortress® Super NOS Blast is an advanced pre-workout that amplifies energy, strength and mental focus...with **MORE SERVINGS PER CONTAINER** at **NEARLY HALF THE COST** when compared to "so-called" leading pre-workout supplements.

**TRAIN INTENSE at LESS EXPENSE with Body Fortress®**

**BODY FORTRESS®**

YOUR BODY. YOUR FORTRESS.®

[WWW.BODYFORTRESS.COM](http://WWW.BODYFORTRESS.COM)



AVAILABLE IN THE PHARMACY DEPARTMENT

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

†Per 2 scoops.

Use in conjunction with an intense daily exercise program and a balanced diet including an adequate caloric intake.

Jamie Varner is a Team Body Fortress® sponsored athlete.

©2015 United States Nutrition, Inc.

15-BF-1014a



Available at Walmart



## MASTERING THE SNATCH AND CLEAN FROM FULL EXTENSION

Performing either the squat snatch or squat clean requires lightning speed and good body position. Athletes must complete the pull during both lifts before going into the squat. Mark DiSanto from the Old Greenwich Sports and Wellness Center in Connecticut, and colleagues, described full-extension exercises for improving performance in the snatch and clean. For the snatch, hold an empty barbell with the snatch grip and go into a full extension by rising up on your toes, extending the knees and hips, elevating the shoulders, and pulling the bar to the chest while holding the elbows outward. Pause for two seconds, and then snatch the bar overhead while going into a squat. Stand up with the bar overhead. The movement is similar for the clean, except that you use a shoulder-width grip, extend fully, go into a front squat and then push up to a standing position. These are terrific exercises for emphasizing full extension during the snatch and clean. (Strength and Conditioning Journal, 37 (1): 1-4, 2015)



## FRONT SQUATS STRESS THE SPINE LESS THAN BACK SQUATS



The popularity of weightlifting (i.e., Olympic lifting) and cross training has led to increased interest in front squats for building total-body strength and improving performance in the clean. Researchers from Gaziosmanpaşa University in Turkey found marked differences in the biomechanics and muscle activation during the front and back squat using maximum loads and experienced lifters. Activation of the vastus medialis muscle (one of the quadriceps) was greater during the front squat than back squat, while activation of the semitendinosus (hamstring muscle) was greater during the back squat. Trunk lean was greatest during the back squat. **Athletes can lift more weight during the back squat, so they are important for maximizing lower body strength.** However, the front squat may be more valuable for building the extensor strength and preventing low back injuries. (Journal of Sport Sciences, published online November 1, 2014)

## IS FIVE SETS BEST for Weight-Training Programs?

In beginning weight trainers, most studies show that one set is as effective as multiple sets for increasing strength and power. However, this is highly controversial. Critics say that most of these studies were poorly controlled, and didn't pay close enough attention to the intensity of the training programs. A Brazilian study using untrained young men found that five sets per weight-training exercise was superior to one or three sets in several measures of strength, during a six-month training program. However, at the beginning of the study, the five-set group was markedly stronger than the other groups, even though the test subjects were randomly assigned to training groups. Training studies are notoriously difficult for researchers. In assessing the practical significance of training studies, we must consider factors such as the training levels of the test subjects, unintended bias in the research design and the supervision of the training sessions. (Journal Strength Conditioning Research, Published Online January 2015)



# 500% BETTER VALUE

The Future of Creatine Technology at an Unbeatable Value

**BODY FORTRESS**

**750 mg Creatine HCl**  
Per Serving

**100 Servings**  
Per Container

**\$13.98\*\***  
Regular Retail Price

**COMPETITOR #1**

**750 mg Creatine HCl**  
Per Serving

**48 Servings**  
Per Container

**\$45.99**  
Regular Retail Price

## 100% Creatine HCl



Available at Walmart\*

Available in the Pharmacy Department.

\*\*Everyday Low Price at Walmart\*

Use in conjunction with an intense daily exercise program and a balanced diet including an adequate caloric intake.

©2015 United States Nutrition, Inc.

14 BF 0000



## DIETARY CARBS *Important for High-Intensity Exercise*

During the first six months of weight loss, low-carbohydrate diets are more effective than low-fat or mixed diets. This has encouraged some athletes to use low-carb diets to fuel their training sessions. This is a mistake. Research since the 1960s has definitively shown that carbs are the main fuel for exercise at intensities above 65 percent of maximum effort. Endurance decreases markedly during low-carb dieting, particularly during repeated training sessions. **A Brazilian study showed that low-carbohydrate diets decreased high-intensity exercise capacity and endurance in physically active men.** Exercise capacity was measured in maximum watts, or the power you produce during training—the more power you are producing, the harder you are working. Notably, the perception of effort was not different between low- and high-carbohydrate diets. In other words, you don't feel any worse during exercise on low-carb diets but you can't exercise as hard. Eat your carbs when you're training hard. (International Journal Sports Nutrition Exercise Metabolism, 24: 532-542, 2014)



## HIGH DAIRY FOOD INTAKE *Increases the Risk of Prostate Cancer*

A meta-analysis that combined the results of 32 studies found that high intake of dairy foods increased the risk of prostate cancer by three to nine percent. Supplemental calcium did not increase the risk of the disease. Both nonfat and whole milk increased the risk of prostate cancer equally, so some component of milk other than calcium or fat might trigger the cancer. Last year, prostate cancer killed more than 30,000 men in the United States, making it the second most common cause of cancer-related death.

Prostate cancer kills only three out of 100 men, yet 50 percent of men over 50 and 75 percent of men over 85 have the disease. Being overweight, obese and smoking increase the risk of dying from the disease. Regular exercise is protective. **Walking briskly for three hours per week reduces the risk of prostate cancer progression by 57 percent.** Eating cruciferous vegetables such as broccoli, Brussels sprouts and cauliflower reduces the progression of the disease. A healthy lifestyle consisting of weight control, regular exercise and a balanced diet is the best way to avoid the deadly form of prostate cancer. (American Journal of Clinical Nutrition, 101:87-117, 2015)



## HIGH DIETARY FIBER *Intake Reduces the Risk of Prostate Cancer*

High dietary fiber reduces the risk of prostate cancer by increasing levels of sex hormone-binding globulin and improving blood sugar regulation—according to a study from the National Cancer Center in Tokyo, Japan. **The incidence of prostate cancer has been increasing in Japan.** Fiber intake is relatively low in that country, but difference in fiber intake was an important predictor of the disease. Higher total fiber and insoluble fiber intake decrease the risk of advanced prostate cancer. The results of this study might not apply to other countries, because the major sources of fiber in the Japanese diet include soy foods, rice and shiitake mushrooms. (American Journal of Clinical Nutrition, 101:118-125, 2015)



## Whole Grains *Linked to Fewer Heart Disease Deaths*

Eating more whole grains is associated with increased longevity and a lower death rate from cardiovascular disease, according to a study of more than 110,000 people led by Hongyu Wu from the Harvard University School of Public Health. Death rates from cancers were not altered by whole grain consumption. **Consuming whole grains may reduce the risk of premature death by 15 percent.** The study confirms the recommendations of national dietary guidelines that people consume more whole grains in their diet. The study examined data from the Nurses' Health Study and the Health Professionals Follow-up Study. They factored out the effects of age, body composition, physical activity and overall diet. The study examined data and death rates over a 25-year period. (JAMA Internal Medicine, published online January 6, 2015)



# GET PUMPED. GO HARD.



**CAFFEINE ■ L-ARGININE ■ CITRULLINE MALATE ■ 0g SUGAR**

The popular pre-workout formula that helps you turn up the intensity on your workouts, NOS Pumped, just launched an exciting new flavor – delicious Strawberry Lemonade!\*

\*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

©2015 MET-Rx® USA, Inc.

15-M7-1016rd

**MET-Rx**  
YOU CAN'T FAKE STRONG™



More styles  
online!

SALE  
\$39.95

Black,  
Charcoal Grey,  
Navy Blue

725  
Y-Back  
Stringer  
Tank Top

Size: Big, Bigger, Biggest

\*with purchase of 3 or more  
\*\*More colors online!

SALE  
\$39.95

Black, Grey,  
Navy Blue

Size: Oversize

5122  
V-Tapered  
Big Top

Phone  
Pocket

SALE  
\$39.95

Black,  
Charcoal Grey,  
Royal Blue

Size: Big, Bigger, Biggest

702  
V-Tapered  
Big Top

SALE  
\$29.95

Black, Navy Blue,  
Grey, Royal Blue

SALE  
\$39.95

Size: Oversize

Shop Online Today!

PHYSIQUEBODYWAREUSA.COM

888-932-7488

Outside the U.S. Call 848-473-4832

## Reduced-Carbohydrate Diet Decreases Fat and Improves Blood Sugar Control

Reducing carbohydrate intake from 55 percent of calories to 43 percent triggered decreases in bodyweight, abdominal fat deposition and insulin resistance in middle-aged, overweight adults—according to a study by Barbara Gower and Amy Goss from the University of Alabama at Birmingham. Fat loss from the lower-carbohydrate diets was greater in African-Americans than in European-Americans. Protein intake was equal for both diets. The lower-carb group also showed lower levels of resting blood sugar. Reducing carbohydrate intake only slightly has a positive effect on body composition and blood sugar regulation. (Journal Nutrition, 145: 1707s-183s, 2015)

## COCONUT OIL: Separating the Street Noise From the Street News

Coconut oil is the latest food to capture the imagination of food faddists. Health claims include weight loss, improved cardiovascular health, prevention of dementia and being an anti-bacterial agent. Little evidence exists to support any of these claims. Coconut oil contains medium-chain triglycerides (MCTs), which have a small effect on weight loss, but the MCT content in coconut oil is much lower than used in weight-loss studies. It's not likely that coconut oil has any significant effect on weight loss. Coconut oil is probably bad for cardiovascular health because it increases LDL cholesterol, which is associated with coronary artery disease. **There is no evidence that coconut oil promotes brain health, prevents dementia or improves immunity.** The widely promoted health benefits of coconut oil are based more on hype than reality. (Nutrition Action Health Letter, December 8, 2014)



## BULLETPROOF COFFEE: The Latest Diet Fad

Bulletproof coffee is a beverage containing coffee, unsalted grass-fed butter (high in omega-3 fatty acids) and medium-chain triglycerides (MCTs). Medium-chain triglycerides are fats that provide a lot of energy in a small volume, just like fat, yet are absorbed and metabolized rapidly, just like carbohydrates. Medium-chain triglycerides may reduce body fat, improve the metabolism of carbohydrates and proteins, enhance the absorption of essential elements such as calcium and potassium, and decrease the risk of heart disease by reducing blood cholesterol and triglycerides.

**There are claims that the Bulletproof line of drinks curbs hunger, improves mental focus and speeds weight loss.** These claims are doubtful. The brain uses mainly carbohydrates as fuels, so the high fat content of the drink would not help brain energetics. Animal studies show that high-fat diets decrease mental function and promote memory loss.

People use Bulletproof coffee as a meal replacement. A cup contains more than 300 calories, which would promote weight gain if people also ate normally. Also, MCTs trigger only minimal weight loss. Fads come and go, so it will be interesting to see if Bulletproof coffee is around one or two years from now. (Lipids in Health and Disease, 13: 194, 2014; The New York Times, December 14, 2014)

## Anthropologists Question the Validity of the Paleolithic Diet

The Paleo Diet emphasizes foods that were available during the Stone Age, or Paleolithic period, before the advent of agriculture and farming. The reasoning is that human genes evolved over millions of years to reflect the hunter-gatherer lifestyle. The Paleo Diet tries to avoid foods such as dairy, grains, legumes, processed oils and refined sugar that were unavailable to cave men.

Anthropologists Ken Sayers and Owen Lovejoy concluded that the elements of the Paleo Diet are almost impossible to determine. Cave people ate whatever was available, and no specific food group was universally important. The average life span of Paleolithic people was 25 years, but some lived to be older. Nutrition was based on survival and reproduction, so genetic adaptations were not necessarily aimed at extreme longevity. Also, modern fruits and vegetables have been selected over time to promote desirable properties that are much different from those available during Paleolithic times.

Many diseases linked to poor nutrition occur because we are living so much longer. It's difficult to say whether consuming a simulated Paleolithic diet—whatever that is—is any healthier. (The Quarterly Review of Biology, published online December, 2014)



# RULE #1: FAMILY FIRST



## WE'VE LIVED IT BEFORE BUILDING IT

We're supplement pros who've done this before

Lifted a few million lbs & downed a few thousand scoops of protein

With over 150 years of combined experience

We bring you the family to rule them all



Get Your Sample Pack Today  
[ruleoneproteins.com](http://ruleoneproteins.com)

100% REAL PROTEINS • 100% REAL AMINOS • 0% SPIKING • 0% BS

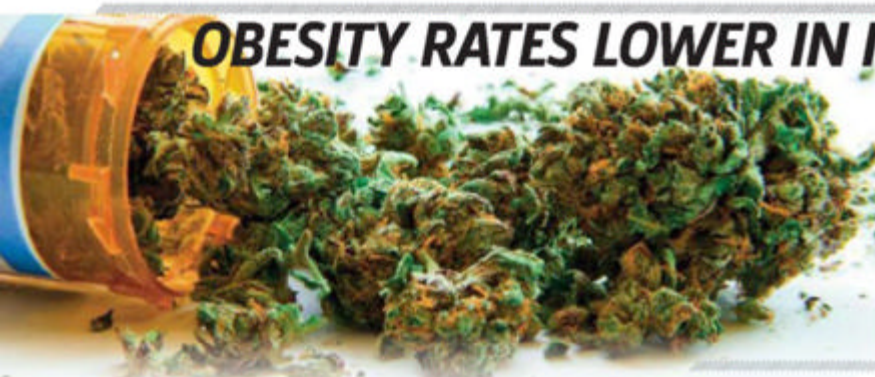


## CHILI INGREDIENT Is an Effective Fat Fighter

Capsaicin (a capsaicinoid) is the chemical that puts the zing in chili peppers. Supplements containing capsaicin increase caloric expenditure for several hours and might be useful as a weight-loss supplement. Capsaicin works by increasing levels of the “fight-or-flight” hormone epinephrine (adrenaline), which speeds fat use and increases metabolism. A study on mice by Baskaran Thyagarajan from the University of Wyoming, and colleagues, showed that increasing capsaicin in their diet prevented obesity by increasing energy expenditure and metabolism. **Most studies show that capsaicin increases daily caloric expenditure by four to five percent and fat use by 10 to 16 percent.** It is not a magic bullet that triggers massive weight loss, but helps promote weight control over time. (Study presented at Biophysical Society Annual Meeting, February 8, 2015)



## OBESITY RATES LOWER IN MARIJUANA USERS



Marijuana smoking triggers the munchies. Conventional wisdom would be that marijuana users would more likely be obese or overweight than nonusers. Inuits, who were native to northern Canada, were studied as part of the Nunavik Inuit Health Survey. These people have a high obesity rate. However, Inuits who used marijuana showed reduced fat mass and lower body mass index (measure of weight to height) and insulin levels. The authors could not explain the reason why marijuana users were leaner. (Obesity, published online December 31, 2014)

## TIME-RESTRICTED FEEDING Prevents Weight Gain

Restricting food intake to specific times during the day prevented weight gain in mice— according to researchers from the Salk Institute for Biological Studies in La Jolla, California. The animals were fed diets high in fructose, fat or both, all of which contained the same number of calories. Some animals were allowed to eat throughout the day, while others were restricted to feeding either nine, 12 or 15 hours per day. Weight gain was smallest for animals eating only nine hours per day and greatest in animals that ate whenever they wanted. The animals on restricted feeding schedules showed better blood sugar regulation. The composition of the diet did not affect the results. **An example in humans might be to not eat anything between 5:00 p.m. and the next morning.** Time-restricted feeding might be a relatively painless way to lose weight and promote metabolic health. (Cell, 20: 991-1005, 2015)



## ADEQUATE SLEEP PREVENTS OBESITY

Getting enough sleep is critical for weight control— according to an editorial in the *American Journal of Clinical Nutrition*. People who sleep longer have a lower body mass index, which is a measure of the proportion of weight to height. Inadequate sleep increases total food intake, snacking frequency, the number of meals consumed per day and the consumption of high-calorie foods. Poor sleep patterns encourage people to eat for pleasure (hedonistic eating patterns). The editorial concluded that sleep is as important as physical activity and proper nutrition for good health. (*American Journal of Clinical Nutrition*, 101: 5-6, 2015)



## GENES PLAY A POWERFUL ROLE In Obesity

In 2013, the American Medical Association classified obesity as a disease. Ninety-five percent of people who lose weight gain it back again within 12 months. Obesity and being overweight are difficult health problems that are highly resistant to cure. British researchers, in a review of literature, concluded that while diet and exercise are important, biological factors related to genetic control need more research emphasis. **Genetic factors, influenced by the environment, can lead to weight gain due to increased appetite and reduced energy expenditure.**

The researchers challenged scientists to study the interaction between genetics and environment so that we can develop more effective treatments against obesity. (Clinical Endocrinology, published online September 22, 2014)



## DO YOU HAVE AN OBESE PERSONALITY?

A famous 2007 study in *The New England Journal of*

*Medicine* found that social networks promote obesity—obese people tend to associate with other obese people, and the size of the obesity network increases over time. In other words, obesity is contagious. A review of literature by German researchers found that some personality types are obesity prone. Impulsive people—people who do things on the spur of the moment—have an increased risk of obesity. Neurotic behavior—overly distressed and showing signs of anxiety, depression, anger, confusion, low sense of self-worth and perfectionism—predicts obesity in women but not men. Extroversion (social and friendly people) is also linked to obesity in both sexes. About 69 percent of Americans are obese or overweight, which includes a lot of personality types. (Obesity Reviews, 16: 32-63, 2015)



## DIOGENE DIET Helps Maintain Weight Loss

Increasing the protein content of the diet by five percent after significant weight loss (25 pounds) resulted in better weight maintenance than consuming diets containing various types of carbohydrates. This was the conclusion of researchers of The Diogenes Project, a randomized clinical trial that was conducted in eight centers across Europe. The test subjects followed an 800-calorie-per-day diet for eight weeks and lost an average of 25 pounds.

**Increasing protein intake helps people maintain weight loss and improves blood pressure, blood fats and inflammation in adults and children.** The post-weight-loss diet was particularly significant because no attempt was made to reduce caloric intake. Increasing protein intake is an easy, effective way to help control bodyweight. (International Journal of Obesity, published online December 26, 2014)

## Single Bouts of Exercise Do Not Increase Appetite

Some weight-control experts caution dieters that physical activity has limited effects on weight control because it increases appetite and food intake. Catia Martins from Norway, and colleagues, found that neither intense nor continuous exercise influence appetite, food intake or hormones controlling appetite. The researchers studied overweight and obese people who performed single bouts of moderate- to vigorous-intensity exercise performed three hours before lunch. All forms of exercise reduced insulin, but none had any effect on lunchtime feeding behaviors. In the short run, vigorous- or moderate-intensity exercise does not increase appetite. (Medicine Science Sports Exercise, 47: 40-48, 2015)

WE'VE GOT  
ONE WORD  
FOR PROTEIN

1  
RULE™

R1 PROTEIN™  
Ultra Pure Whey Isolate/Hydrolysate  
BCAA-Fortified Protein Powder

NET WT 4.8 LB (2.2 KG) • 16+ SERVINGS

IT'S CALLED  
PROTEIN

More protein.  
Less money.  
Smart.

Pure Whey Isolate/Hydrolysate  
Zero Concentrates  
Zero fat, sugar, lactose, gluten\*  
No creamers & gums  
Zero spiking!

\*Depending on Flavor

Get Your Sample Pack Today  
[ruleoneproteins.com](http://ruleoneproteins.com)



● BY STEVE BLECHMAN AND THOMAS FAHEY, EdD

# SCIENTISTS GROW HUMAN MUSCLE IN A DISH

Researchers from Duke University have grown fully functional human muscle in the laboratory from tissue called myogenic precursor cells. The muscle contracts when stimulated, which allows scientists to test the effects of drugs and nutrients on muscle function. In the future, physicians will be able to use the technique to determine optimal drug doses for treating muscle diseases. The researchers are also using stem cells to grow muscle in the lab, which would allow muscle transplants. Using the procedure with beef, pork and chicken, muscle would also produce a food source without the need for ranchers and farmers. (The Wall Street Journal, January 24, 2015; eLife, published online January 9, 2015)



## ALCOHOL INHIBITS MUSCLE PROTEIN SYNTHESIS

Most coaches advise athletes to avoid alcohol during intense training. It turns out they were right. Alcohol consumption slows protein synthesis triggered by resistive exercise—according to a study on mice by scientists from Penn State College of Medicine. The animals received 10 sets of six repetitions of electrical muscle stimulation. Two hours later, they were injected with enough alcohol to cause intoxication. Electrical stimulation increased protein synthesis by 28 percent, but the alcohol stopped the process. If these results apply to humans, athletes should refrain from alcohol consumption following intense exercise designed to increase muscle mass. (Alcoholism: Clinical and Experimental Research, 39: 1-10, 2015)

## MASSAGE REDUCES Muscle Stiffness

Post-exercise soreness is painful and debilitating. Eccentric exercise (lengthening muscle contractions), such as downhill walking or negatives, often causes sore muscles by triggering muscle injury and secondary muscle inflammation. Most studies found that popular remedies such as ice, non-steroidal anti-inflammatory drugs (e.g., Advil) and heat do not speed recovery. Several recent studies found that massage decreased post-eccentric exercise inflammation and promoted recovery, particularly if done immediately after exercise. An Australian study showed that massage decreased muscle stiffness, even in people who hadn't exercised. Researchers measured the stiffness of the calf muscles using a technique called ultrasound shear elastography. Massage reduced stiffness for only a short time, but it was effective. (Scandinavian Journal of Medicine Science Sports, published online December 8, 2014)

## AIR POLLUTION AND HEALTH CLUBS

Gather 100 or so exercising, sweaty people in a large room and you would expect some pungent odors. A study led by Carla Ramos from the University of Lisbon in Portugal showed that gym air pollution goes way beyond the smell of sweat. Air-quality measurements in 11 large health clubs in Lisbon showed that levels of carbon dioxide, dust, formaldehyde and carbon monoxide exceeded public health standards. Sources of the air pollution included chemicals used for cleaning, inadequate sanitation and high gym use rates. Air quality was measured during the late afternoon and early evening when the gyms were most crowded. The poor air quality could contribute to fatigue and trigger lung problems such as asthma and shortness of breath. (Building and Environment, 82:349-360, 2014)





## HIGH BLOOD PRESSURE A HEALTH RISK FOR ATHLETES

Regular, moderate-intensity exercise reduces resting blood pressure, which can decrease the risk of stroke, heart attack, erectile dysfunction and kidney disease.

Many health experts assume that the beneficial effects of exercise transfer to competitive athletes. This could be a mistake, according to a review of literature by Norwegian researchers. Studies of more than 138,000 athletes showed no evidence that blood pressure was lower in athletes than non-athletes. Power athletes with enlarged hearts (left ventricular hypertrophy) showed higher blood pressure, but the results might have been affected by body size and the use of anabolic drugs. The researchers noted that the studies varied in blood pressure measurement techniques, which might have influenced the results. Competitive athletics do not protect athletes from high blood pressure. (British Journal Sports Medicine, published online January 28, 2015)



## What To Do About Thinning Hair

Everybody loses hair as they age—some people more than others. Male-pattern hair loss occurs mainly in the front of the scalp, while age-related hair loss occurs throughout the scalp. Stress can trigger temporary hair loss, as can coloring, blow-drying and chemically straightening your hair. Drugs like minoxidil can promote hair growth, but they can decrease testosterone levels and sex drive and trigger depression. Hair-loss remedies such as biotin are untested, but they probably can't hurt. People can camouflage hair loss, but this is often ridiculous as in the case of the classic comb-over. Hair transplants can be effective in some people, and other people eliminate the problem by shaving off all their hair. Hair loss is part of the human condition. The most significant problem is in the mind, so suck it up! (Harvard Women's Health Watch, September 2014)

## BELLY FAT INCREASES THE RISK OF SUDDEN CARDIAC DEATH

Sudden cardiac death is rare, particularly in athletes. In people under 35, a condition called hypertrophic cardiomyopathy is the most common cause. In older adults, coronary artery disease is usually the culprit. A study led by Selcuk Adabag from the Veterans Affairs Medical Center in Minneapolis found that abdominal obesity increased the risk of sudden cardiac death by 100 percent, compared to abdominally lean people. Abdominal obesity was identified by high body mass index (weight proportional to height), waist circumference and waist-to-hip ratio. The results were adjusted for the effects of high blood pressure, diabetes, abnormal blood fats and the presence of heart disease, heart failure and heart enlargement. Researchers speculated that abdominal fat deposition might increase whole-body inflammation. (Heart, published online November 19, 2014)



YOUR PLAN FOR  
SUCCESS IS  
TRANSPARENT



R1 PRE TRAIN  
Energy, Focus & Fuel  
Pre-Workout Performance

DIETARY SUPPLEMENT • NET WT 535g (18.9oz)

SHOULDN'T YOUR  
PRE-WORKOUT BE?

Superior.  
Transparent.  
Smart.

BCAAs • L-Taurine • Beta-Alanine  
L-Citrulline • L-Tyrosine • AAKG  
Agmatine Sulfate • Anhydrous Caffeine  
Green Tea Extract • Green Coffee Bean

Check out our transparent formula  
& get your sample pack today

[ruleoneproteins.com](http://ruleoneproteins.com)



● BY STEVE BLECHMAN AND THOMAS FAHEY, EdD

## Green Tea Extract **TOXIC TO THE LIVER**

Epigallocatechin gallate (EGCG) is a polyphenol found in green tea extract that enhances the action of insulin, improves blood vessel health, lowers blood pressure and promotes weight loss. However, a study on mice from China and Rutgers University found that EGCG was toxic to the liver by reducing important antioxidants that protect it from free radical damage. Free radicals are highly reactive chemicals linked to cell membrane damage, destruction of DNA and cell death. People should be extremely careful about taking supplements that affect individual performance or physiological variables. While they might improve performance, they could also have serious side effects. (Toxicology and Applied Pharmacology, 283: 65-74, 2015)



## **TYROSINE** *Increases* MENTAL FUNCTION *During Heat Exposure*

Studies have shown that supplementing the amino acid tyrosine improved concentration. Tyrosine is a precursor to dopamine, a brain chemical that controls thought processes. A study from the United Kingdom showed that tyrosine supplements improved mental effort and vigilance in soccer players subjected to a 90-minute simulated match in the heat. Many researchers believe that central nervous system fatigue is an important reason that performance decreases in athletes during prolonged exercise. Tyrosine may improve mental function during intense training and competition. (European Journal of Applied Physiology, 115: 373-386, 2015)

## BETA-ALANINE IMPROVES JUMP PERFORMANCE IN SKIERS

Beta-alanine improved jumping power and performance in alpine skiers on a 90-second box jump test—according to researchers from the Karolinska Institute in Sweden. Alanine is an amino acid that helps supply energy during exercise. It is converted to blood sugar in the liver by a process called the glucose-alanine cycle. While it is not used to synthesize muscle tissue or enzymes, it influences exercise capacity—particularly endurance performance. Other studies found that alanine improved strength-endurance performance. Doses of 10 grams per day caused tingling and numbness in the skin. Beta-alanine might be a good supplement, but there might be side effects in high doses. (International Journal Sports Nutrition and Exercise Metabolism, 24:665-673, 2014)



## WHEY PROTEIN SUPPLEMENTS PRESERVE MUSCLE MASS DURING WEIGHT LOSS

Muscle mass is extremely difficult to preserve when cutting fat for a contest. During reduced caloric consumption (dieting), the body uses energy from protein for fuel. In other words, the body feeds on itself. Amy Hector and Stuart Phillips from McMaster University in Canada, and colleagues, found that whey protein supplements could prevent decreases in muscle protein synthesis during weight loss. They studied men and women aged 35 through 65 who consumed 750 fewer calories than normal. The test subjects supplemented their diets with either whey or soy protein. Whey protein effectively prevents decreases in muscle protein synthesis during weight loss. (Journal Nutrition, published online December 17, 2014)





# RIVALUS™

WE'RE PRO-ATHLETE

## SAME POWERFUL TEAM BRAND NEW UNIFORM

The first sports supplements developed specifically to pro athlete specs - are sporting a new look.  
We manufacture in our own state-of-the-art NSF & GMP approved facility.  
We design it. We make it. We sell it. We ship it.



GMP **NSF** CERTIFIED  
FACILITY

INFORMED-  
CHOICE **ORG.**  
Trusted by sport

PRO & OLYMPIC ATHLETE TRUSTED WORLDWIDE  
**100%** WADA **COMPLIANT**

☎ 800-620-4177 🖥 RIVALUS.NET 🐦 @RIVALUS

AVAILABLE AT  
**GNC**  
LIVE WELL



● BY STEVE BLECHMAN AND THOMAS FAHEY, EdD



## CITRULLINE PROMOTES ABDOMINAL FAT LOSS

Citrulline is an amino acid that promotes protein synthesis and fat loss. A French study from Paris Descartes University on overweight rats fed high-fat diets found that supplementing citrulline reduced blood sugar production in the liver, and triggered abdominal fat loss. Citrulline increases brown fat activity, which increases caloric expenditure and promotes fat burning. **Brown fat is a highly thermogenic tissue that dissipates energy as heat instead of storing it as fat.** Citrulline increased levels of hormone-sensitive lipase by 150 percent, which also promoted fat mobilization and use. (Molecular Nutrition Food Research, 58: 2320-2330, 2014)

## CREATINE Improves Blood Vessel Health and Lowers Blood Pressure

Creatine monohydrate is a wonder supplement! It increases muscle mass, boosts strength and power, improves performance during interval training, spares muscle mass during aging, prevents muscle deterioration in diseases like multiple sclerosis, improves mental focus and boosts energy levels. **Brazilian researchers showed that it reduced average resting blood pressure by three millimeters of mercury (mmHg) in young adult men, a decrease of nearly 10 percent.** Creatine also improved the vitality of blood vessels and increased skin capillary density. Creatine monohydrate works by increasing creatine phosphate levels in cells. Creatine phosphate is a high-energy compound that indirectly fuels most cell functions. (Nutrition, Journal 13: 115, 2014)



## Leucine Is a Key Nutrient for Regulating Body Composition

Leucine is an amino acid that serves as a building block for protein—according to a literature review by researchers from the Ministry of Agriculture in China. More importantly, it is an important regulator of protein and fat metabolism. It activates the mTOR pathway, which is vital for **muscle protein synthesis. It also promotes the growth of mitochondria, which are cellular energy centers vital to cell health and longevity.** Leucine is particularly vital as a nutrient in aging adults, lactating women and people on calorie-restricted diets. Leucine should be taken to increase muscle mass and cut fat. (Frontiers in Bioscience, Landmark, 20: 796-813, 2015)

## Combining VITAMIN D and CALCIUM SUPPLEMENTS *Could Be DANGEROUS*

Calcium and vitamin D supplements are extremely popular, and have individually been touted as important health promoters. Health experts often recommend calcium supplements for strengthening bone, improving blood clotting and optimizing nerve conduction and muscle contraction.



**Vitamin D supplements have been recommended for preventing cancer, heart disease, fractures and falls, autoimmune diseases, flu, type 2 diabetes and depression.** A review of literature by British researchers cautioned that the combination of calcium and vitamin D supplements could be dangerous because they might promote heart attack and increase blood pressure, abnormal blood fats and insulin resistance. One

study in women showed that a supplement containing a combination of calcium and vitamin D reduced the risk of breast and colon cancer by nearly 20 percent, but increased the risk of heart attack by 24 percent. More research is needed on the combination of these supplements because of their widespread use. (Atherosclerosis, 238: 388-398, 2015)



# PROLAB. DEFY



## BUILD MORE MUSCLE<sup>†</sup>

PROLAB® helps you supersize your gains when you want to pack on dense new muscle mass. Get powered up with Quick Fire® to fuel explosive performance and push your training to the next level. Replenish with Beta Alanine Extreme® to help delay muscle fatigue and maximize every rep, then reload with N-Large3 packed with 45 grams of mass-generating protein. PROLAB® provides you a complete mass-gaining advantage to help you defy your limits – and surpass them. You do your part. We'll do ours.®†

**PROLAB.**  
PERFORMANCE SIMPLIFIED®



[prolab.com](http://prolab.com)

†These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.

© 2015 PROLAB, Inc.



## WHAT GOOGLE TELLS US **ABOUT SEX**

Based on Google searches, men and women lie about how much sex they have. Google search expert Seth Stephens-Davidowitz summarized what people say in sex surveys and what Google searches reveal about their sexuality. American men and women say that they have sex around 60 times per year and use condoms 20 percent of the time. That adds up to more than 1.1 billion condoms. But, Google statistics show only 600 millions condoms were sold last year, so somebody isn't telling the truth.

Americans also lie about unprotected sex. Roughly 11 percent of sexually active women don't use contraception. Since about 10 percent would get pregnant, birthrates would be much higher than the current national pregnancy rate of one in 113 women of childbearing age.

Analyses of Google searches also show that Americans have a lot of sex-less relationships, more men than predicted by surveys are closeted gays, and sexual anxiety is a common problem in men and women. Men are particularly hung up on penis size and premature ejaculation, while women are concerned about vaginal odor and personal appearance.

Google searches might reflect what people don't know rather than their sexual practices, so we're not quite sure what goes on in the bedroom. (The New York Times, January 24, 2015)



## THE DEFORESTATION *of American Women*

Until recently, most women had a healthy bush that signaled men that they were nearing the Promised Land. That's changed. Scott Butler from Georgia College & State University, and colleagues, in a study of 1,110 college-age men and women, found that 95 percent had removed pubic hair in the past four weeks. Women shaved to increase feelings of cleanliness, comfort, sex appeal and conformity to sexual norms. Sixty percent of men said they preferred hair-free partners. Women reported more genital itching than men due to removing pubic hair more frequently. (Journal Sexual Medicine, 12: 48-58, 2015)

## NUMBING CREAMS HELP PREMATURE EJACULATORS

Premature ejaculation is the most common sexual problem, particularly in young men. The problem has been attributed to sexual inexperience and overenthusiasm because it usually goes away as men age. Chinese researchers, however, found a physiological cause for the problem. They applied numbing cream (prilocaine and lidocaine) and measured nerve activity in the spinal column and around the head of the penis. Premature ejaculators showed increased neural activity, which shows that hyperactivity was an important cause of the problem. If you are a premature ejaculator, try numbing creams to increase staying power. (International Journal Impotence Research, 26: 186-190, 2014)



## GET IT UP ON DEMAND

Erectile dysfunction affects more than 50 percent of men aged 40 through 70. The incidence is even greater in men who smoke and those with abdominal obesity, insulin resistance, high blood pressure and poor metabolic health. Since the 1990s, men have relied on drugs such as Viagra, Levitra and Cialis to fight the problem. Unfortunately, these drugs required advanced planning, which decreased

spontaneity. Also, short-acting drugs such as Viagra caused uncomfortable side effects in many men, such as headache and congestion. Modern treatment includes low daily doses of these drugs, which improves sexual spontaneity and decreases the incidence of side effects that accompany larger doses. This method works even without testosterone replacement therapy. (Endocrine News, December 2014)



**RIVALUS™**  
WE'RE PRO-ATHLETE

## MULTI-STAGE PROTEIN FOR 8-HOUR POWER



TIMED-RELEASE  
PROTEINS



WHEY ISOLATE  
WHEY HYDROLYSATE  
MILK ISOLATE  
WHEY CONCENTRATE  
GOAT'S MILK  
EGG ALBUMEN  
MICELLAR CASEIN

**24g**  
OF PROTEIN

**28.9g**  
SERVING SIZE

**83%**  
PROTEIN

**β**  
BETA-ALANINE  
ENHANCED

**#1** **WHEY  
PROTEIN  
ISOLATE**

PRO & OLYMPIC ATHLETE TRUSTED WORLDWIDE

**100% WADA COMPLIANT**

**7**

multi-stage  
released proteins

**#1**

primary protein  
whey isolate

**31**

servings per  
container

**0**

banned  
substances

**PROVEN**

ELITE MULTI-SOURCE PROTEIN FOR ATHLETES

SOFT-SERVE VANILLA

NATURAL & ARTIFICIAL FLAVORS



# RAGING BULL SERIES

**WITH A KICK OF CAFFEINE!**



**CARNIVOR RAGING BULL** provides all the muscle building power of beef, plus an energizing kick of caffeine. For the most intense, high energy workouts and the maximum anabolic effects of pure Beef Protein Isolate, ride the new **CARNIVOR RAGING BULL!**

**ANRT™ RECYCLES AMINOS AND MINIMIZES AMMONIA**

**PACKED WITH ANABOLIC MUSCLE BUILDING AMINOS FROM PURE BEEF**

**LOADED WITH CREATINE AND BCAAs**

**125mg OF CAFFEINE!**

**MuscleMeds**  
PERFORMANCE TECHNOLOGIES

**MuscleMedsRx.com • 888.575.7067**

**Join Team MuscleMeds!**

facebook.com/TeamMuscleMeds  
twitter: @MuscleMeds  
instagram: MUSCLEMEDS

**GNC** LIVE WELL **100% Vitamin**

© 2015 MuscleMeds. All rights reserved. These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, cure, treat or prevent any disease. Your results may vary.



## ONLINE PERV HEAVEN

If the eyes are the windows to the soul, then the Internet is the window to uninhibited sex. A free live cam site called [chaturbate.com](http://chaturbate.com) features women, men, transsexuals and couples in various stages of undress having sex and masturbating with vibrators, dildos, vegetables and sex machines. The site is sexual democracy at its best, because anyone anywhere in the world can be a cam model. Models range in age from barely legal 18-year-olds to senior citizens. All you need is a webcam and a free membership. Models make money from optional tips in the form of tokens purchased for 10 cents each. The models get five cents from each token tip, and Chaturbate gets the other five cents. Peeping Toms no longer need to peer through windows while hiding in the bushes—they can see almost anything they want on the Internet. (Medium.com, January 20, 2015)

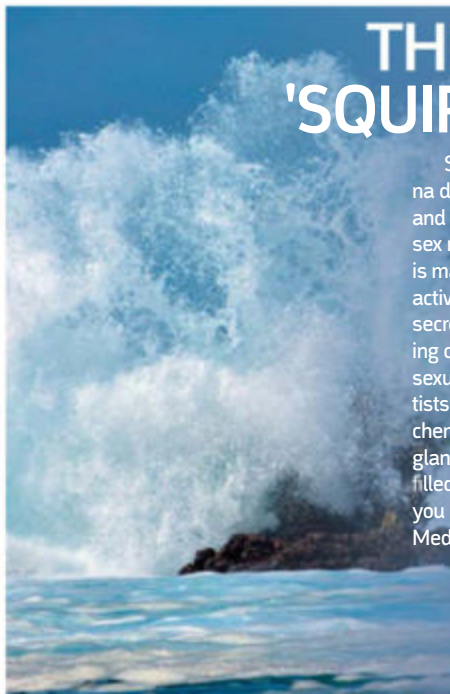
## POOR BLOOD SUGAR CONTROL LINKED TO PREMATURE EJACULATION

Blood sugar control is an important marker of good metabolic health. A study from the University of Naples in Italy showed that men with type 1 diabetes, and non-diabetics with poor blood sugar control, showed an increased risk of premature ejaculation (PE). The average guy spends 15 minutes on foreplay, thrusts 90 times during sex and can last seven minutes before ejaculation. The 30 percent of men who suffer from PE last less than two minutes before climax. Factors increasing the risk of premature ejaculation include past history of sexually transmitted diseases or urinary tract infections, poor health, emotional stress, loss of income, past history of same-sex activity, history of sexual harassment, and childhood abuse. Men can improve metabolic health through exercise and diet, which might decrease the incidence of premature ejaculation. (Journal Sexual Medicine, 12: 93-99, 2015)



## THE TRUTH BEHIND 'SQUIRTING' REVEALED

Squirting, the involuntary release of fluid from the vagina during female orgasm, is a popular theme in porno films and webcam sex shows. It is also controversial among sex researchers. French researchers found that squirting is mainly the involuntary release of urine during sexual activity. They studied the chemical composition from the secretions of seven women who were prolific squirters during orgasm. The women emptied their bladders and then sexually stimulated themselves until orgasm. The scientists found that the secretions were mainly urine with some chemical residue from the Skene's gland (female prostate gland). Ultrasound showed that the women's bladders filled somewhat just prior to orgasm. This study will help you better understand porno films. (Journal of Sexual Medicine, published online December 24, 2014)





# RIVALUS™

WE'RE PRO-ATHLETE

100% WHEY PROTEIN  
WHEY ISOLATE #1 SOURCE



WHEY PROTEIN  
**ISOLATE**

WHEY PROTEIN  
CONCENTRATE

WHEY PROTEIN  
HYDROLYSATE

**24g**  
OF PROTEIN

**28.9g**  
SERVING SIZE

**83%**  
PROTEIN



**#1** **WHEY PROTEIN ISOLATE**

PRO & OLYMPIC ATHLETE TRUSTED WORLDWIDE

**100%** WADA  
IOC **COMPLIANT**

**100**  
percent  
whey protein

**#1**  
primary protein  
whey isolate

**31**  
servings per  
container

**0**  
banned  
substances

800-620-4177 RIVALUS.NET @RIVALUS

SOFT-SERVE VANILLA 100% WHEY - WHEY ISOLATE PRIMARY SOURCE

NATURAL &  
ARTIFICIAL FLAVORS



# *Build the Ultimate* **X-FRAME**



Take one look at Optimum Nutrition athlete Steve Cook and it's clear he's been living and breathing the health and fitness lifestyle for quite a while. Of course, he didn't exactly have much of a choice— that's how it goes when you grow up in a household of athletes with a father who works as an athletic director.

"I was always playing or watching sports," Cook remembers, "so I started training at like 10 or 11 years old. I remember my family would watch games on TV, and every commercial break I would have to do 50 push-ups. And it wasn't just watching TV. If I wanted to go over a friend's house? Fifty push-ups. Go to a movie? Fifty push-ups."

It wasn't just push-ups. Cook's pre-teen training years included plyometrics, sprints at the track and just about any other challenge his dad could think of.

"I loved the feeling of moving weight," Cook says. "As a seventh-grader I benched more than my brother, who was a senior at the time. I saw results quickly. I always loved being the strong kid. I loved having the look, but I was also very competitive."

A three-sport athlete in high school, Cook went on to play linebacker at Utah's Dixie State University. It was there that he started honing the physique that has helped him develop into one of the world's top fitness models.

"I would do all the Olympic and powerlifts with the team— cleans, deadlifts, snatches," Cook remembers. "And then I would come back on my own and do my bodybuilder stuff later on at night. I couldn't get enough of it."

# Get **JACKED SHREDD**



A full-page photograph of a very muscular man, Steve Cook, in a gym. He is shirtless, showing his highly defined chest, abdominal, and arm muscles. He is holding a barbell over his shoulders with both hands. He is wearing red athletic shorts. The background is a blurred gym environment.

BY ALLAN DONNELLY  
PHOTOGRAPHY BY GREGORY JAMES

# & ED

WITH STEVE COOK





## SEATED DUMBBELL PRESS

**Cook's Tip:** "I concentrate on keeping the pinkies up and kind of tipping the dumbbell down, so my pinkies are higher than my thumbs at the top of the movement. I feel this really creates more tension on the shoulder."



After college, Cook competed in a few local bodybuilding contests. And while it helped give him motivation and an outlet for his competitiveness, the bodybuilding look and the direction of the modern-day physiques didn't fit into his long-term plans.

"You have to sacrifice some functionality in bodybuilding because you're trying to get as big as you possibly can," Cook says. "That doesn't mean you're going to be going out and hiking for three or four hours if you want to. I didn't really like the bulk—I liked having abs, a tight waist, a good pair of shoulders. To me, the Greek statues

were the ideal. Guys like Steve Reeves—it's the full package, and I think the Golden Era of bodybuilding embodied that."

Cook got a chance to sculpt his ideal physique in 2011, when the National Physique Committee formed the Men's Physique division. A natural from the start, Cook earned his pro card in just his third contest and quickly developed into one of the division's top competitors.

And while competing will always be a part of who he is, Cook knows success onstage isn't what keeps him

coming back to the gym day after day, week after week. What keeps that fire burning is the same thing that ignited it in the first place—that feeling of the weight in his hands and the ability to build a physique worthy of those Greek statues he grew up admiring.

"I've always been an athlete and I don't want to lose that," Cook says. "I don't want to get so big and not be able to move. I don't want to have the appearance of something that I'm not. I think you can have both—the look and the functionality."

## WIDE-GRIP UPRIGHT ROW

**Cook's Tip:** "I keep my elbows flared out, shoulders rotated back and pull the weight up to the bottom of my chest. It's easy to do these wrong and let the traps take over; you don't want that to happen."



**"TO ME, THE GREEK STATUES WERE THE IDEAL. GUYS LIKE STEVE REEVES— IT'S THE FULL PACKAGE, AND I THINK THE GOLDEN ERA OF BODYBUILDING EMBODIED THAT."**





#### LEANING ONE-ARM CABLE LATERAL RAISE

**Cook's Tip:** "Don't let the cable come back to your body or to a resting position. Keep tension on the shoulder the entire time. Sometimes on these I'll even take the handle off and just grab the ball. I keep my pinky turned all the way up and then rotate it at the top to really activate the medial delt."



#### BENT-OVER CABLE LATERAL RAISE

**Cook's Tip:** "Don't come back to a resting position between reps, or let the cable get all the way back to the starting position. Try not to bring your back up as you pull the cable back, stay at a fixed angle, keep the core tight the entire time and have a solid base."

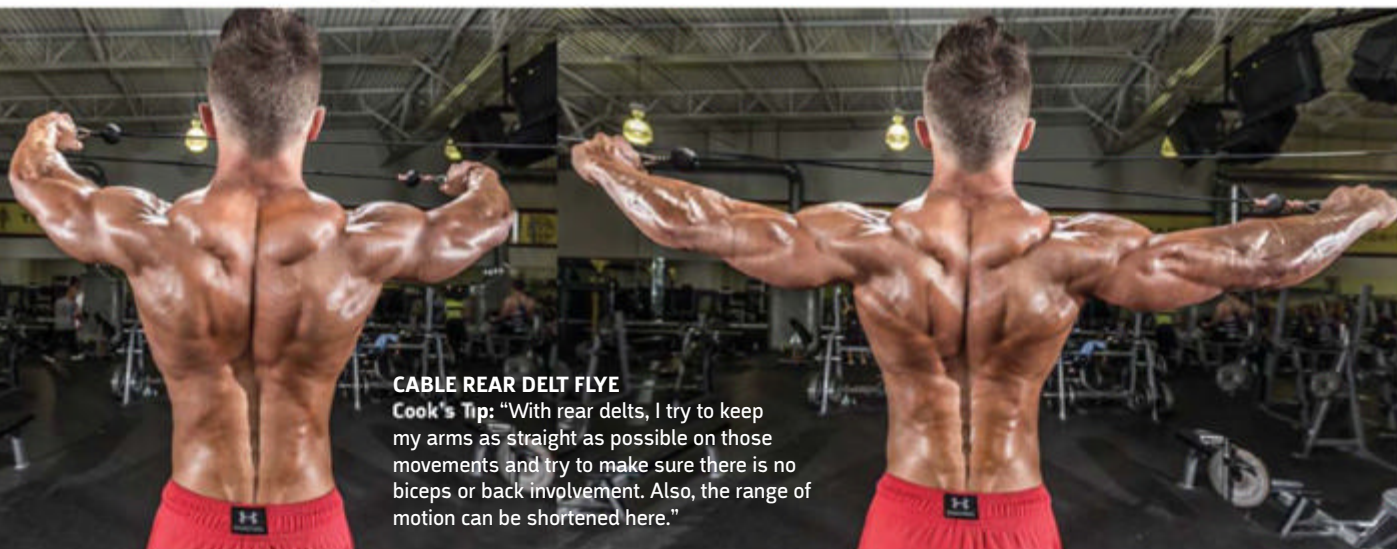
#### TRAIN LIKE AN ATHLETE

While most of Cook's training is geared toward building muscle and burning body fat, he still tailors his workouts and lifestyle toward maintaining a functional, athletic physique.

"I always tell people to stick with the basics—bench, squats, deadlifts, work in some cleans and a few different types of presses," Cook says. "Do those movements often with a lower rep range—around six to 10—and then mix those in with auxiliary lifts. On those auxiliary lifts, you should really slow down, focusing on the contraction and isolating the muscle you are trying to work."

He continued: "My style of training still, to this day, focuses





## CABLE REAR DELT FLYE

**Cook's Tip:** "With rear delts, I try to keep my arms as straight as possible on those movements and try to make sure there is no biceps or back involvement. Also, the range of motion can be shortened here."

## WEAK POINT WORKOUTS

### SHOULDERS

Exercise	Sets	Reps
Seated Dumbbell Press	4	12-15
Wide-grip Upright Barbell Row	3-4	10-12
Leaning One-Arm Cable Lateral Raise	3-4	12-15
Bent-Over Cable Lateral Raise	3-4	12-15
Cable Rear Delt Flye	3-4	12-15

### ABS

Exercise	Sets	Reps
Windshield Wipers	3	15-20
Oblique Cable Crunch	3	15-20
Oblique Twist	3	25-30
Rope Cable Crunch	3	15-20

### CALVES

Exercise	Sets	Reps
Standing Barbell Calf Raise	3	8-10
Seated Calf Raise	3	21*

\*7 reps toes pointed in, 7 reps toes pointed out, 7 reps neutral stance

## WINDSHIELD WIPERS

**Cook's Tip:** "Don't let momentum take control here, even though you are in a position that is very hard to maintain that control. You have to be strong enough where you can slow down before you get horizontal to the ground. Try to keep your legs as straight as possible."



## CARDIO

"I do both steady-state and high-intensity cardio," Cook says. "HIIT, your body and central nervous system really takes a beating—it's like another leg day, very demanding on the posterior chain. I'll save my high-intensity stuff for off days or when I'm training smaller body parts like arms or shoulders."

For HIIT sessions, Cook will start with a five-minute warm-up, then go all out for 15 minutes before cooling down for another five minutes.

"I try to do intervals in the 30- to 45-second range," Cook says. "But if I'm sprinting, I'm absolutely exhausted after 30 seconds, so it's different for all of the different elements. If I'm biking I can go a little bit longer. Swimming—I love doing swim sprints for 15 to 20 seconds but I can't sustain that any longer. On all of those I'll rest until I feel like I'm fully recovered and back to where I can go all out again."

Cook's steady-state cardio sessions will range from 20 to 40 minutes depending on the day. "I keep my heart rate at around 65 percent, 130 to 140 beats per minute," he says. "It can be anything from walking on an incline, the elliptical or even getting outside for a hike."



## OBLIQUE CABLE CRUNCH

**Cook's Tip:** "Really focus on bringing your elbow down toward your opposite knee— even though they won't touch. You want to make sure you are twisting your body as you pull the cable down to really target the obliques."

on a lot of those more athletic movements. When I'm doing the pretty physique stuff, I don't care about the amount of weight I'm lifting. You don't pump yourself up before doing a biceps curl like you do for a big, heavy squat. The aggression that comes out— it's scary to get under a bar with 500 pounds on it. It kind of makes you feel like a man. I still need that."

## WEAK POINT TRAINING

On a normal week, Cook is in the gym six days a week, training at least two muscle groups each workout. His workouts are a mix of compound and isolation movements, with the heavier, power-based exercises falling first in the order.

In Cook's eyes, one of the keys to building a classic X-frame physique isn't just focusing on your strengths— it's picking out your weak points and making those a priority above everything else. That usually means devoting an entire day to those areas, what Cook likes to call weak point training.

"I think you need to focus on your weak areas and not just



## AB TIPS

### BE WELL-ROUNDED

"You're always going to be working all of the abs— I think most people who are serious trainers know it's hard to isolate one area. That said, lower abs are definitely the hardest thing to sculpt, for me. I think the upper abs get so much work from secondary movements that they tend to develop more than lower abs."

### WATCH THE WEIGHT

"I don't do a ton of weighted exercises because I don't really want to over-

develop the muscles in the abdominal region. My goal is to have a tight waist. Some people have strong, powerful abs but that doesn't necessarily translate to an aesthetic physique."

### MIX IT UP

"If I'm training abs four days a week, it will be a mix of circuit training and straight sets— one day a whole circuit, the next time do either straight sets or one exercise for four rounds before moving on to something else. All of my circuits typically have at least one oblique exercise, sometimes two."





## CABLE WOOD CHOPPER

**Cook's Tip:** "Keep your forearm as straight possible as you pull the cable across your body as you pull the handle towards your opposite hip. Make sure you are twisting your torso as you pull the cable down to really target the obliques."

## SAMPLE DAILY MEAL PLAN

### MEAL 1: 8 AM

2 whole eggs  
8 egg whites  
½ ounce avocado  
½ cup steel cut oats w/almond milk  
½ banana

### MEAL 2: 11 AM

6 oz ground bison burger  
2 slices Ezekiel bread  
Steamed vegetables

### MEAL 3: 2 PM (POST-WORKOUT)

30-40 grams Optimum Nutrition whey protein  
35 g dextrose/waxy maize

### MEAL 4: 5 PM

6 ounces chicken breast  
½ cup whole-grain pasta  
2 tbs tomato sauce  
Small garden salad

### MEAL 5: 8 PM

Optimum Nutrition Protein shake with fruit or Protein bar

## ROPE CABLE CRUNCH

**Cook's Tip:** "I like to finish off the movement almost like I'm doing a pullover, where I crunch as far down as I can with my abs, then focus on pulling the rope down to really engage the serratus for a maximum contraction."





# "BEST PHYSIQUE IN THE WORLD"

JEREMY BUENDIA  
Olympia Physique Champion

BURNING FAT  
WHILE NOT  
LOSING  
MUSCLE IS  
NOT A SKILL,  
BUT AN ART.

Learning how to achieve this balance can take years of trial and error. Fortunately, Evogen Nutrition takes the guesswork out of the process with the Shred-Fast Stack. This precisely formulated stack was developed by Hany Rambod, The Pro Creator® and used by Jeremy Buendia, getting him shredded to win the 2014 Olympia Physique title. When Lipocide and Carnigen are combined, the synergy of these two products is extremely powerful. Now this stack is finally available to you.†



**SHRED-FAST™ STACK**  
Lipocide + Carnigen

[Shop.EvogenNutrition.com](http://Shop.EvogenNutrition.com)

**SAVE 15%**  
Use code FRXM15



THE NEXT GENERATION OF SUPPLEMENTS

**EVOGEN®**

[EvogenNutrition.com](http://EvogenNutrition.com) | 408.364.1650

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease. †When combined with a proper exercise and nutrition program. Please consult with your physician before using this or any other dietary supplement product.



## OBLIQUE TWIST

**Cook's Tip:** "Make sure to get a good squeeze at the end of each rotation. This is an exercise where you can use a higher rep range to really get the obliques burning."

**"I THINK YOU NEED TO FOCUS ON YOUR WEAK AREAS AND NOT JUST ENHANCE AND GROW YOUR STRONG AREAS."**



## COOK'S KEYS TO OLYMPIC/POWER MOVEMENTS

### START LIGHT

"Weight goes out the window until you have the correct form down. The last thing I ever want to preach is doing exercises fast."

### WARM-UP

"Make sure you do a full-body warm-up and then focus on whatever you're working that day. I like to start with mobility exercises for my hips, knees and shoulders."

### DON'T SACRIFICE FORM

"If you've never done Olympic or these powerlifting movements before, make sure to study others. YouTube is a great resource, there are tons of videos out there that can help you learn."

## STANDING BARBELL CALF RAISE (not pictured)

**Cook's Tip:** "The biggest thing with calves is, on the way down get a maximum stretch. Keep your knees slightly bent, then come up on the big toe and hold it there for a half count. No bouncing."

## SEATED CALF RAISE

**Cook's Tip:** "I'll do 21s sometimes on these, where I point my toes in three different directions— in, out and then straight forward. Seven reps at each position for a total of 21."



enhance and grow your strong areas," he says. "For me, my weak point training usually involves some type of deltoid work, especially exercises targeting the medial head, and also abs or calves. I'll train calves up to four days a week and alternate high-rep days (12-20) with lower-rep days (8-10)."

"Abs are always high reps for me, around 15 to 20. I like to start with the most demanding exercise first. Besides cable crunches, everything is typically bodyweight exercises."

"On that second day of shoulder training for the week, I'm not focusing a ton on pressing movements. That's what my first shoulder day is for. For the second workout, I'll do maybe one pressing movement but then really focus on the medial/lateral and posterior delts."



# Power up for your best-ever performance

Intense activity and workouts dehydrate your body and drain cells of glycogen, the energy stores that power your muscles. Sustamine® is a clinically tested sports recovery ingredient that combines amino acids L-Glutamine and L-Alanine. This unique combination works on multiple levels to restore your strength.\* It enhances electrolyte and water absorption in the intestines, helps replenish glycogen and promotes healthy muscle repair.\* It's also rapidly absorbed for faster recovery.\* For hydration and muscle repair that can noticeably increase your competitive edge, look for products formulated with pure, vegetarian, allergen-free Sustamine.\*



For serious performance and recovery  
benefits, find products with Sustamine at  
[www.sustamine.com](http://www.sustamine.com)



Follow Sustamine®

\*These statements have not been evaluated by the Food and Drug Administration.  
This product is not intended to diagnose, treat, cure, or prevent any disease.

Sustamine® is a registered trademark of KYOWA HAKKO BIO CO., LTD.  
Copyright ©2015 KYOWA HAKKO U.S.A., INC. All Rights Reserved.

Look for brands with Sustamine®  
in their formulations





# **SUPERSET** **CHEST & BACK** **WORKOUT**

***With 2014 Mr. Olympia  
Physique Champ Jeremy Buendia***



**BY ALLAN DONNELLY  
PHOTOGRAPHY BY GREGORY JAMES**





Three years doesn't seem like a very long time to most. To Jeremy Buendia, it was basically a lifetime ago.

That's when Buendia, a 21-year-old aspiring bodybuilder at the time, decided to leave his past behind, in a sense, and make the transition to the newly formed Men's Physique division. Breaking the news to the trainer he was working with at the time, however, didn't exactly go as planned.

"I walked into his gym and told him I wanted to try Men's Physique," Buendia remembers. "He asked me why I wanted to do it and I said 'I want to win the Olympia.' His wife, who was an IFBB Pro, pretty much fell on the ground laughing at me. They didn't think I was going to do well, but I knew it was the right move."

No one's laughing now.

Last September, Buendia reached that goal and solidified his status as the No. 1 competitor in the Men's Physique division by winning the prestigious Men's Physique Showdown at the industry's biggest event, Joe Weider's Olympia Weekend.

Weighing in at just 170 pounds at a height of 5 foot 8, Buendia's combination of muscle density, roundness and symmetry helped him hold off a lineup in which most of his competitors outweighed him by 30 pounds or more.

"My small waist and V-taper help me onstage, but what puts me over the top is my chest," Buendia says. "I don't think anybody can match the fullness that I have—I feel that's one body part that separates me from everybody else on that stage. It's hard to compete when I'm 170 pounds going against guys that are over 200, but that chest fullness really helps create a three-dimensional look onstage that I feel makes me more well-rounded than everyone else. A lot of guys are lacking that depth."

That's not to say there isn't room for improvement. Buendia knows that, in order to stay on top, he'll need to continue to get better in certain areas—most notably his back.

"I still feel the depth and detail in my back are areas I need to improve on," Buendia says.

Buendia knows he'll need to focus making that weakness a strength if he hopes to fulfill his next goal—defend his title and become the Men's Physique division's first two-time Olympia champion.

Here is a look at two priority areas that will remain a focus for Buendia this year, and his approach to training those body parts.



## CHEST DAY

"Even though it's a strength, chest is always priority area for me," Buendia says. "It gives me that more balanced, more powerful physique look and that's what stands out for me."

Buendia starts every workout with a 10- to 15-minute warm-up, which includes a variation of shoulder rotation and light shoulder exercises, stretching, foam rolling and very light overhead squats.

"Overhead squats connect the whole kinetic chain," Buendia says. "When I'm lifting, I want everything to be working together. When you're doing an overhead squat, everything along your back, your lower back, your hamstrings has to be activated in order to nail that exercise correctly. It's a good warm-up for the whole body."



## THE WORKOUT

### EXERCISE #1: INCLINE DUMBBELL PRESS

**Sets:** 6  
**Reps:** 15, 12, 10, 8, 8, 15-20 (drop set)

"I always start off with dumbbell incline; I like to go really heavy on those. I'll almost always do a drop set for my last set—15-20 reps real nice and slow. I'll drop down to about 60 percent of my one-rep max and just do real slow negatives, feeling it out and getting a deep stretch. My last set is always a lighter set where I just

focus on technique and feeling the muscle.

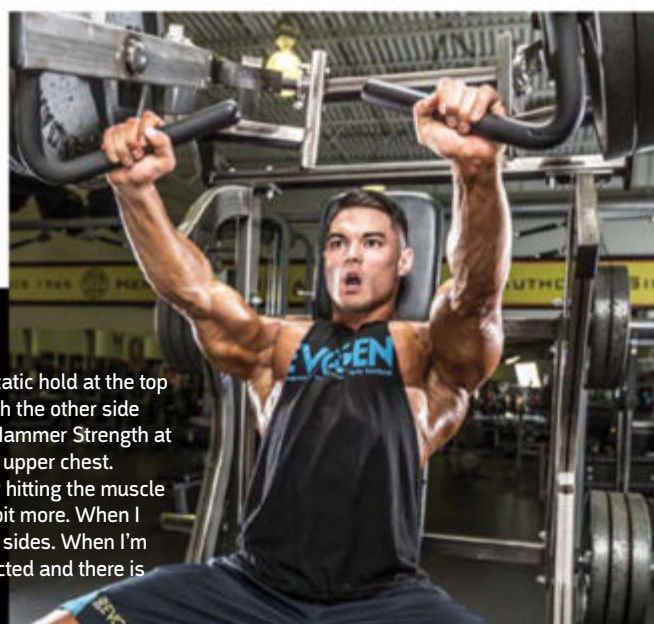
"The focus here is using exact proper form—I see everybody doing bench presses wrong, utilizing their front delts and traps too much. I always roll my shoulders down and back, it just enables me to open up my chest a little more. I don't ever lock out either, I always stop about three-quarters of the way up to keep constant tension on the muscle and go below 90 degrees on the bottom portion."

### EXERCISE #2: HAMMER STRENGTH INCLINE PRESS

**Sets:** 4  
**Reps:** 15

"I do these a little bit different. I like to do five full reps and then do a static hold at the top with my left arm and do five with my right arm, then do the same thing with the other side and then finish with a burnout of five more reps. I don't go very heavy on Hammer Strength at all because I really like to emphasize squeezing the pecs to really nail the upper chest.

"Compensations can take place on either side of the body, so I start by hitting the muscle together and then like to do one arm at a time to isolate each side a little bit more. When I finish off those last five reps, all those muscle fibers are activated on both sides. When I'm holding in the static position, I'm not locked out, so my chest is still contracted and there is always tension on the muscle."



### EXERCISE #3: INCLINE DUMBBELL FLYE

**Sets:** 4  
**Reps:** 15, 12, 10, 10

"I don't go heavy on these because I've had a pec tear before. I like to really take the exercise nice and slow. I don't go as deep on these as I do incline presses, I keep my arms extended pretty well and don't bend my elbows as much as most people—just a slight bend in my elbows to really emphasize that stretch. I feel like I can activate the pecs more, go a little bit lighter and limit my range of motion."



***"If I recruit the right muscles to contract and pull, I just get more of a mind-muscle connection as opposed to just blasting through the reps quickly."***



#### **EXERCISE #4: INCLINE SMITH MACHINE PRESS**

**Sets:** 4

**Reps:** To failure (10-15 reps)

"I do a combination partial to full rep on these, which I count as one rep, using up to 225 pounds. I come all the way down, controlling the weight, do a partial rep where I go halfway up, lower the back down and then do my full rep. That's one rep for me on these. I just feel it gives me a better pump, a better mind-muscle connection. Again I'm not locking out at the top of the full rep to keep tension on the chest. I go to failure on these since they're towards the end of the workout, which is typically between 10 and 15 reps."

#### **AB OVERVIEW**

Even though he admits they are his least favorite body part to train, Buendia works his abs almost every day of the week, focusing on a different area each workout.

"I don't train the same part of my abs every day, I'll train upper abs, then obliques and rotate heavy days and lighter days," he says. "Abs are a muscle group that recovers quickly, because it's a muscle that's used all the time— kind of like calves. So the recovery time is a lot less. I always want to keep my abs activated; I just rotate the exercises depending on how I'm feeling that day and what muscle groups I'm training. I always do them at the end of the workout."

#### **SAMPLE AB CRUNCH WORKOUT**

EXERCISE	SETS	REPS
Rope Cable Crunch	5	20
Decline Reverse Crunch	4	25
Weighted Ab Crunch	4	15
Swiss Ball Crunch	4	20

\*Rest for 45 seconds between each exercise



#### **EXERCISE #5: CABLE FLYE**

**Sets:** 4

**Reps:** 10-12

"I usually end with FST-7 on this exercise. I'm just basically trying to overwhelm the muscle with blood flow. It's constant tension on the muscle and with short rest periods— 20 seconds between sets— you're going to optimize the pump. Towards the end of the workout, my strength is basically gone at that point so it's just about feeling and squeezing the muscle. I'm still able to finish strong with this technique even though it's the end of my workout."

#### **CONTROL THE REP**

"I use a real slow rep speed, a very controlled tempo," Buendia says. "My negatives are very controlled. When you're performing exercises like that it doesn't take that much weight to get a pump and get the blood flowing in there. I can go to the gym and curl a 30-pounder or I can go to the gym and swing a 70-pounder, but I'm gonna get more out of the 30 if I'm controlling the range of motion. I make sure I'm in control of every single part of that rep. When I'm training, I really break down what's going on physiologically in the body; I like to see what the muscles are doing— stretching and contracting. If I recruit the right muscles to contract and pull, I just get more of a mind-muscle connection as opposed to just blasting through the reps quickly. It's injury preventative, too."





## BACK WORKOUT

### EXERCISE #1: WIDE-GRIP PULLDOWN

Sets: 4  
Reps: 15, 12, 10, 8

"I always start with pull-ups or pulldowns," Buendia says. "It's one of the major movements of the back and I'm always working on my V-taper, so it's something I want to target first. I always emphasize the stretch, always do full range of motion on these. I pull the bar right to my chin; I don't like to go all the way down to my chest because I like to keep constant tension on my lats. I arch my back slightly and sit my hips back on the machine so my knees are on the pad, not my thighs."



### EXERCISE #2: T-BAR ROWS

Sets: 4  
Reps: 15, 12, 10, 8

"Foot and hip placement is very important on these," Buendia says. "A lot of people don't engage the lower back; they round it and that puts a lot of pressure on the wrong spots. When you do that, you're not pulling with the right part of your back, you're pulling with your upper back and your traps. When you set your hips, arch your back, keep your butt out and your chest up, you engage the lower lats and your lower back, the erector spinae. I don't touch the ground, I reach down and make sure I'm opening my lats up and stretching them out. The first motion is pulling the shoulders back behind you so you're engaging the Christmas tree. Then you're pulling your hands to your hips, keeping the elbows tucked to your sides. It's really a short range of motion on this exercise if you're doing it correctly."



## PYRAMID DOWN

"Pyramiding down— starting with high reps and a lighter weight, then increasing the weight and lowering the reps as you go— is just a fundamental I was brought up on. That's the way my dad taught me to work out and it's something that has always worked for me. If I start lighter with weight, I get the muscle warmed up and get that muscle to fire. If I start heavier that might not happen. It's basically priming your muscle for the harder sets."

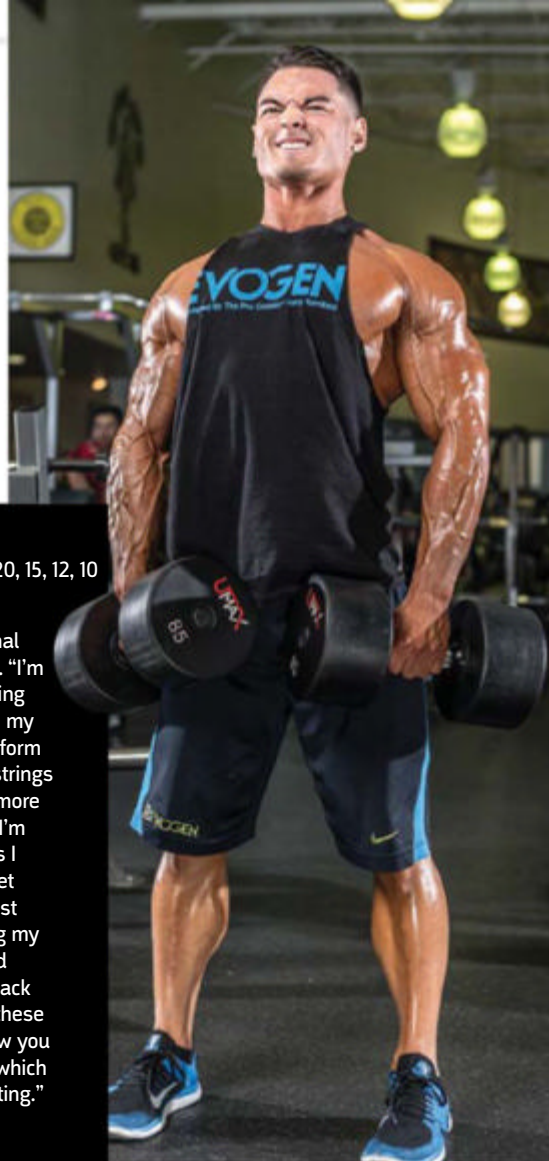
### JEREMY BUENDIA'S TRAINING SPLIT

DAY 1: CHEST  
DAY 2: BACK  
DAY 3: LEGS  
DAY 4: SHOULDERS  
DAY 5: ARMS



## REFEED ON CHEST DAY

"Since chest is an area I'm trying to focus on, I jump my carbs up to over 300 grams and eat as much as possible on that day. I try to get three or four good, clean meals with a high volume of carbs, but also throw in two cheat meals that day. I'm trying to over-nourish the body, get in more natural creatine through red meats and use a lot more simple carbohydrates that are going to spike my metabolism a little bit and shock the body because I'm not eating that stuff throughout the week. So when I throw these new foods in, my body responds real well and in turn it's going to grow quicker and be more anabolic. When you're training that muscle, we're breaking it down what you're putting in your body is how you recover. The idea behind it is to over-nourish the body, give your body more than it needs so I'm not lacking anything."



### EXERCISE #3: STIFF-LEG DUMBBELL DEADLIFT

Sets: 4  
Reps: 20, 15, 12, 10

"This is just a traditional stiff-leg deadlift," he says. "I'm keeping my hips out, making sure that the tension is on my lower back, keeping good form but making sure my hamstrings aren't taking over. This is more of a mid-range of motion, I'm not going quite as deep as I would when trying to target the hamstrings—going just past the knees and pulling my shoulder blades down and back to squeeze the low back when I'm coming up. I do these on leg day too; it's just how you perform the exercise and which muscle group you're isolating."



### EXERCISE #4: ONE-ARM DUMBBELL ROW

Sets: 3  
Reps: 15, 12, 10

"I like to do these standing at the dumbbell rack, hips out, lower back engaged with a limited range of motion," Buendia says. "I'm reaching down and pulling the weight to my hip, keeping my elbow tucked. I like to keep my palm open, so I'm using a supinated grip. I feel like it hits the very bottom part of my lat and that's one of my weak points. I'm trying to get my lats to drop a little bit lower and that's the one exercise I feel targets that area really well."





# ***Get Ripped in 8 Weeks!***

***A Scientific Approach!***

## ***Gain Muscle and Lose Fat***

### **COMPLETE TRAINING AND NUTRITION PROGRAM**

Summer is nearly here, so you only have a few months to get into peak beach shape. Fortunately, breakthroughs in sports science make it possible to make gains in eight weeks that used to take six months to a year.

High-intensity, explosive training (HIET) is the key to rapid gains in aerobic capacity, muscle mass, strength, power, and fat loss that will take your fitness to the next level. Most guys spin their wheels when trying to build muscle and cut fat. They go through the motions but don't reap the rewards of superior fitness. HIET turns on biochemical pathways that trigger muscle hypertrophy and mobilize fat-burning hormones that give you that lean, athletic look. This type of training is not for the faint of heart. Combine high-intensity training with protein and amino acid loading and you will make faster progress than you thought possible.







BY THOMAS FAHEY, ED.D.  
PHOTOGRAPHY BY GREGORY JAMES  
MODEL: IFBB PRO LOGAN FRANKLIN





**LEG PRESS:** From a seated position, place your feet on the pedals or platform of the leg press machine. Push your legs forcefully until they are nearly fully extended and then returned to the starting position.

**KNEE EXTENSIONS:** Sit on the knee-extension bench and place your shins on the pads. Extend your knees until they are straight; then return to the starting position.



**SQUATS:** Rest the bar on the back of your shoulders and hold it in that position with your hands. Keep your head neutral and lower back straight. Squat down (under control) until your thighs are approximately parallel with the floor and butt is about one-inch lower than the knees. Drive upward toward the standing position, maintaining a neutral spine throughout the exercise.



**LEG CURLS:** Lie face down on the leg curl bench, and place the bottom part of your lower leg underneath the pads. Flex your knees and drive your heels towards your butt and then return to the starting position.



Science is changing the way we train. HIET fits the bill for a training method that builds muscle strength and size rapidly, promotes fat loss, develops fitness quickly, activates anabolic hormones and creates long-term changes in muscles that promote lifelong fitness. HIET turns on a metabolic pathway called mTOR (mammalian target of rapamycin) that regulates muscle growth and repair. It also maximizes the time the muscle tissue is under tension, which is vital for muscle hypertrophy. HIET builds muscle satellite cells, which are genetic structures that increase the ability of the muscles to make new proteins. HIET triggers the release of growth hormone, IGF-1, testosterone and epinephrine that streamlines the body by promoting muscle growth and reducing fat.

What is high-intensity, explosive training? HIET involves three sets of 10 repetitions per exercise using moderate loads (75 to 85 percent of one-rep maximum) and performing reps explosively. The program is supplemented with high-intensity interval training (HIIT) that involves maximal intensity intervals performed on an elliptical trainer, stationary bike, treadmill or track.

HIET and HIIT programs are exhausting and difficult. Unlike other programs, you will see amazing changes in only eight weeks. This is not hype or fitness media nonsense—the program works. It is not for wimps or girly-men who get their workout gloves caught on their dresses. This is for dedicated men who want to get into training shape in a hurry.

## THE SCIENCE BEHIND HIGH-INTENSITY EXPLOSIVE TRAINING

Increasing strength is simple: make the muscles work against increased resistance. Muscle strength is highly related to muscle size. The best way to increase muscle size is through high-tension explosive weight-training exercises. The HIET program uses a well-rounded assortment of standard bodybuilding exercises that you perform explosively using good form.



HIET increase muscle mass and strength at an incredibly fast rate. Canadian researchers, led by Tim Shepstone, found that high-speed training increased muscle cross-sectional area and the size of fast-twitch motor units (muscle fibers and their nerve) better than slow-speed training. High-speed contractions caused greater disruption at the cell level, which promoted muscle protein synthesis and caused larger increases in muscle mass and strength.

We are beginning to understand why high-intensity explosive training works so well. HIET creates high levels of metabolic stress that include the release of inflammatory chemicals such as prostaglandins and free radicals (i.e., reactive oxygen species) that combine with other chemicals and cell structures to trigger cell damage. Cell damage from these chemicals stimulates protein

**LUNGES:** Stand with your feet shoulder-width apart and the bar resting on the back of your shoulders with your hands holding the bar in that position or hold a dumbbell in each hand. Lunge forward with one leg, bending it until the thigh is parallel to the floor. The heel of the lead leg should remain on the ground. Do not shift your weight too far forward or let the knee move out past the toes. Repeat the exercise using the other leg. Keep your back and head as straight as possible and maintain control while performing the movement.

synthesis, which results in gains in muscle mass and strength. Performing standard bodybuilding exercises explosively creates high levels of metabolic stress for prolonged periods (15 seconds to several minutes) that triggers cell inflammation and promotes increases in muscle mass and strength.

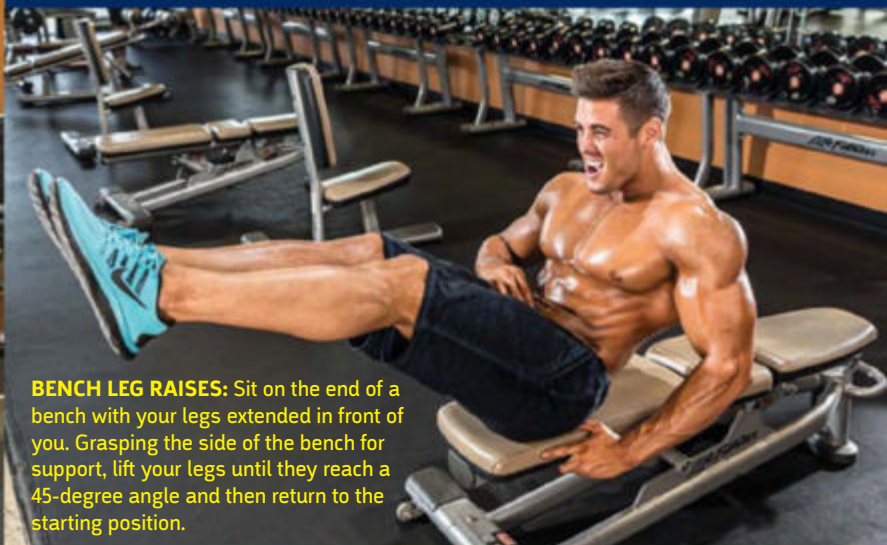
HIET programs promote weight loss. Many recent studies have shown the power of high-intensity interval training



**SWEDISH BALL OBLIQUE CURLS:** Lie on your back on a Swedish ball with your right knee bent and right foot flat on the floor and the other leg lying perpendicular on the floor. Place your right hand on the back of your head and curl up using the muscles on the right side of your abs. Repeat on the opposite side.



**CABLE TRUNK CRUNCHES:** Using the rope attachment, kneel in front of a lat machine with arms extended. Flex your trunk until your elbows touch the floor and then return to the starting position.



**BENCH LEG RAISES:** Sit on the end of a bench with your legs extended in front of you. Grasping the side of the bench for support, lift your legs until they reach a 45-degree angle and then return to the starting position.





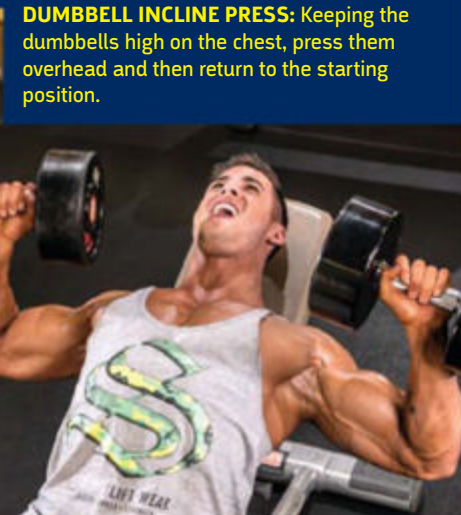
## BENCH PRESS AND MACHINE

**BENCH PRESS:** Lie on the bench with your feet flat on the floor. Grasp the bar slightly more than shoulder-width apart. Have the spotter help you move the bar from the rack to a point over your chest. Lower the bar in a straight line slightly below the end of the breast bone. Push the weight straight up to the starting position. You can also do this exercise on a plate-loaded machine.

**MILITARY PRESS:** With the weight racked at chest level, push the weight overhead until your arms are extended, then return to the starting position. Be careful *not* to arch your back excessively.



**DUMBBELL INCLINE PRESS:** Keeping the dumbbells high on the chest, press them overhead and then return to the starting position.



for increasing metabolic rate and reducing body fat. HIET workouts are consistent with the kinds of exercises that produced rapid weight loss while maintaining muscle mass. The combination of explosive weight training and high-intensity interval training triggers rapid fat loss. Combining HIET with HIIT will provide astounding results in only eight weeks.

## HIGH-INTENSITY INTERVAL TRAINING

High-intensity interval training sounds too good to be true. In studies of moderately trained people, practicing HIIT for only 20 minutes in two weeks triggered changes in aerobic capacity and endurance that took months from traditional endurance workouts practiced 30 to 60 minutes per day. Few exercise techniques are more effective for improving fitness rapidly than HIIT.

The four components of interval training are distance, repetition, intensity and rest, defined as follows:

- Distance refers to either the distance or the time of the exercise interval.
- Repetition is the number of times the exercise is repeated.
- Intensity is the speed at which the exercise is performed.
- Rest is the time spent recovering between exercises.

Canadian researchers found that six sessions of high-intensity interval training on a stationary bike enhanced endurance, maximal oxygen consumption, muscle glycogen and mitochondrial capacity (mitochondria are the powerhouses of the cells). The subjects made these amazing improvements by exercising only 20 minutes over a period of two weeks. Each workout consisted of four to seven repetitions of high-intensity exercise on a stationary bike. Each repetition consisted of 30 seconds at near-maximum effort. Follow-up studies showed that practicing HIIT three times per week for six weeks improved endurance and aerobic capacity just as well as training five times per week for 60 minutes. These studies (and more than 60 others) showed the value of high-intensity training for building aerobic capacity and endurance. You can use interval training in your favorite aerobic exercise. In fact, the type of exercise you select is not important as long as you exercise at near-maximal intensity.



## COMBINING HIET WITH HIIT

The program involves interval training two to three days per week and weight training three days per week. For best effect, do intervals and weights on separate days.

**Interval training:** Practice HIIT on an elliptical trainer or stationary bike two to three days per week for 10-20 minutes each workout. Sprint for 30 to 60 seconds at 100 percent of maximum effort on a stationary bike or elliptical trainer, followed by light recovery exercise for two minutes. Each workout, do six to 10 sets of these maximum sprints.

**High-intensity Explosive Training:** Choose eight exercises per workout from the following list. Do three sets of 10 repetitions, resting one minute between sets. Use a weight that allows you to complete the sets with some difficulty (75 to 85 percent of maximum effort). Use good form for each exercise but try to perform each rep explosively. Each workout should contain two of the leg exercises, at least one ab exercise, three chest and shoulder exercises, and three arm exercises. Try to include most or all of these exercises into your workout each week.

### LEGS:

Squats

Leg press

Knee extensions

Leg curls

Lunges

### ABS:

Swedish ball oblique curls

Cable trunk crunches

Bench leg raises

### CHEST AND SHOULDERS:

Machine bench press

Bench press

Barbell military press

Dumbbell incline press

Dips

Incline push-ups

Cable flyes

Cable upright row

Dumbbell raises

### ARMS:

Preacher curls

Concentration curls

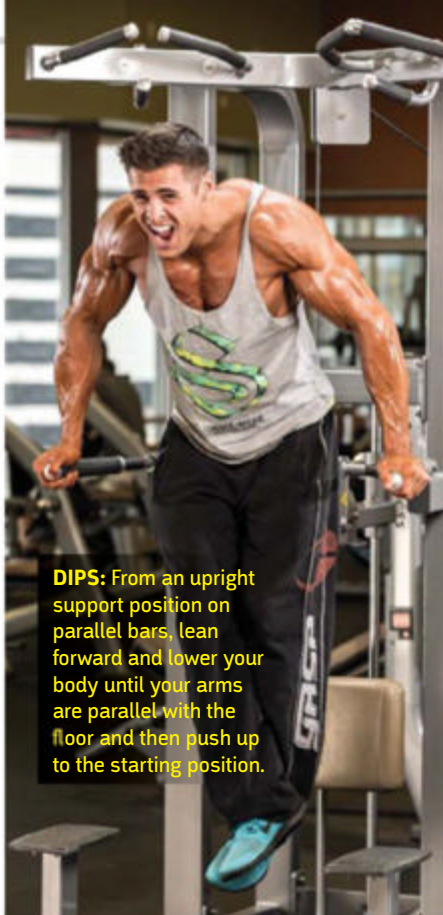
Reverse curls, EZ bar

Cable triceps extension with reverse grip

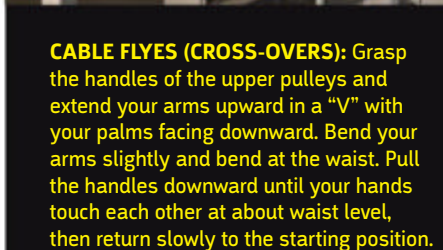
Seated dumbbell French curl

Cross-body dumbbell extension

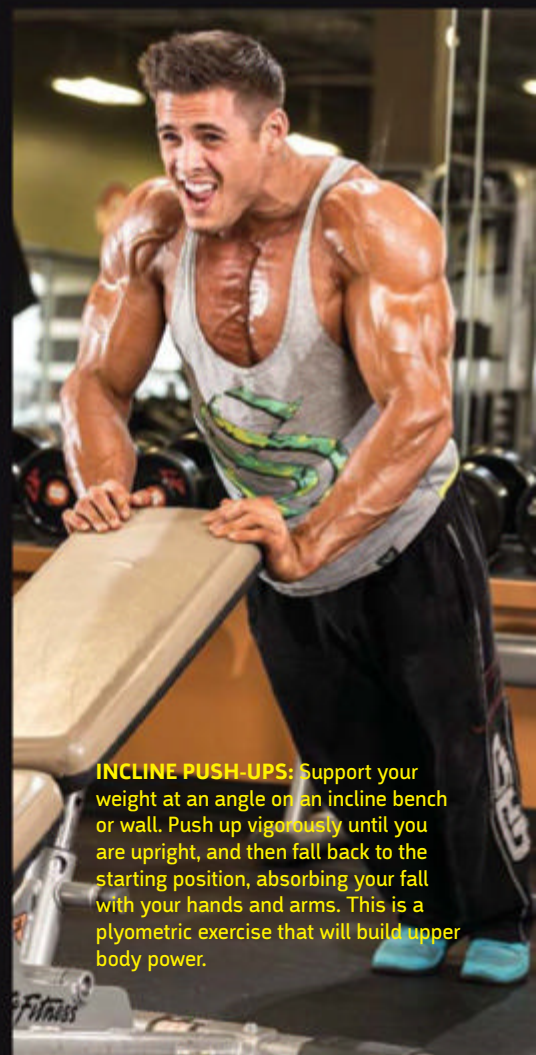
One-arm cable triceps extension



**DIPS:** From an upright support position on parallel bars, lean forward and lower your body until your arms are parallel with the floor and then push up to the starting position.



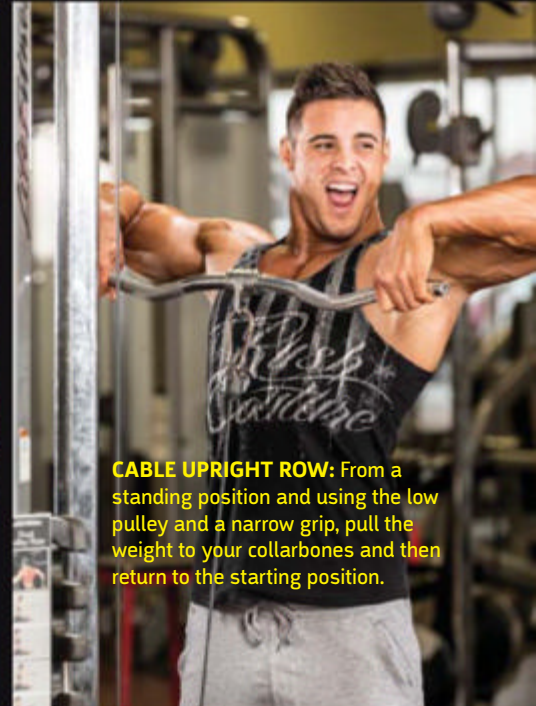
**CABLE FLYES (CROSS-OVERS):** Grasp the handles of the upper pulleys and extend your arms upward in a "V" with your palms facing downward. Bend your arms slightly and bend at the waist. Pull the handles downward until your hands touch each other at about waist level, then return slowly to the starting position.



**INCLINE PUSH-UPS:** Support your weight at an angle on an incline bench or wall. Push up vigorously until you are upright, and then fall back to the starting position, absorbing your fall with your hands and arms. This is a plyometric exercise that will build upper body power.



**CABLE UPRIGHT ROW:** From a standing position and using the low pulley and a narrow grip, pull the weight to your collarbones and then return to the starting position.







**DUMBBELL RAISE:** This exercise develops your deltoids, the round-like muscles that form the shape of your shoulders. Because of the shape of this muscle, you must do this exercise to the front (anterior deltoid), side (lateral deltoid) and back (posterior deltoid) to develop all parts of it.

**PREACHER CURLS:** Use a supinated grip to hold the weight, place your elbows on the preacher stand, and fully extend your elbows. Bend your arms ("curl" the weight) until they almost reach your collarbone, then return to the starting position.



## SIMPLE NUTRITIONAL STRATEGY FOR MUSCLE HYPERTROPHY AND MAXIMUM FAT LOSS

This is an exhausting workout, so you need energy. You can build muscle and control appetite and body fat at the same time by consuming a shake containing 25 grams of whey protein, three grams of the amino acid leucine, and five grams of creatine monohydrate mixed with water, milk or juice. The nutrients in this simple shake combined with the training program will help you build muscle and cut fat.

## TRAIN INTENSELY AND FIRM UP QUICKLY

It is no problem to gain muscle and lose fat fast if you follow a few basic principles and stick with the program. More importantly, you can maintain your new weight. If you start today, eight weeks from now there will be a new you. You will be thinner, vibrant, healthier and look terrific. The ball is in your court—promise to make fitness and diet priorities in your life and you will achieve the kind of body you want.



**SEATED DUMBBELL FRENCH CURL:** Grasp a dumbbell behind your head. Keep your elbow up and stationary, extend your arm until the weight is overhead and then return to the starting position.

## REFERENCES:

- Bottaro, M, et al. Effect of high versus low-velocity resistance training on muscular Fitness and functional performance in older men. *Eur J Appl Physiol.* 99:257-264, 2007
- Colliander, EB and PA Tesch. Responses to eccentric and concentric resistance training in females and males. *Acta Physiol Scand.* 141:149-156, 1991.
- Cronin, JB, et al. Force-velocity analysis of strength-training techniques and load: Implications for training strategy and research. *J Strength Cond Res.* 17:148-155, 2003.
- De Vos, NJ, et al. Optimal load for increasing muscle power during explosive resistance training in older adults. *J Gerontol A Biol Sci Med Sci.* 60:638-647, 2005.
- Fahey, TD, P Insel, and W Roth. *Fit and Well.* New York: McGraw Hill, 2015 (11th edition).
- Gaesser, GA and SA Siddhartha.

High-intensity interval training for health and fitness: can less be more? *J Appl Physiol* 111: 1540-1541, 2011.

Paavolainen, L, et al. Explosive-strength training improves 5-km running time by improving running economy and muscle power. *J Appl Physiol.* 86:1527-1533, 1999.

Sale, DG, et al. Neuromuscular function in weight-trainers. *Exp Neurol.* 82:521-531, 1983.

Seger, JY and A. Thorstensson. Effects of eccentric versus concentric training on thigh muscle strength and EMG. *Int J Sports Med.* 26:45-52, 2005.

Shepstone, TN, et al. Short-term high- vs. low-velocity isokinetic lengthening training results in greater hypertrophy of the elbow flexors in young men. *J Appl Physiol* 98: 1768-1776, 2005.

Zehr, EP and DG. Sale. Ballistic movement: Muscle activation and neuromuscular adaptation. *Can J Appl Physiol.* 19:363-378, 1994.





**ONE-ARM CABLE TRICEPS EXTENSION:** Using the high pulley, grasp single handle using a supine grip and elbow held close to the side. Extend your elbow fully and then return to the starting position.



**REVERSE CURLS, EZ BAR:** Stand holding the weight at your waist with a pronated grip (palms down, the opposite of barbell curls). Lift the weight by bending your elbows until the bar almost reaches your collarbone and then return to the starting position.



**CROSS-BODY DUMBBELL EXTENSION:** Lie on the bench and hold a dumbbell straight up in the air with your arm. With your elbow pointed outwards, bend at the elbow and lower the dumbbell across your body to your opposite shoulder. Extend the elbow and lock out your arm.



**CABLE TRICEPS EXTENSION WITH REVERSE GRIP:** Use a narrow, supine grip; grasp the bar of the lat machine and fully extend your arms with your elbows held closely at your side. From this starting position, with elbows locked at your side, allow your hands to be pulled up to your chest and then firmly pull the weight back to the starting position.






# **EXPLOSIVE PLYOMETRIC TRAINING**



**GET BIGGER, STRONGER  
AND MORE POWERFUL**

*By Michael J. Rudolph, Ph.D.*





Plyometric training is more than simply jumping up and down to improve vertical leap performance. This form of training, when performed correctly, can induce tremendous gains in muscular power that, when combined with intense resistance training, can potentially increase muscular size and strength. Plyometric training can be used to train most body parts, including the upper body, where there are some fantastic plyometric movements that boost upper body development— not to mention the plethora of well-established plyometric jumping movements that generate tremendous lower-body size and power. So, while many dismiss plyometric training as solely for the athlete, the ability of plyometric training to increase muscle size and strength, especially when used in conjunction with weight training, makes it a great training modality for anyone trying to get into better shape.

PER BERNAL PHOTOGRAPHY

### ***Most Effective Plyometric Exercises***

The standard plyometric workout consists of five to six sets within the five- to eight-repetition range, and approximately 90 seconds of rest between each set. The most effective plyometric exercises typically utilize just your bodyweight with no additional resistance. Some of the more popular and effective plyometric movements include box jumps, squat jumps and plyometric push-ups— which are one of my favorite plyometric exercises that I add as a finishing movement on bench press day, resulting in noticeable gains in the bench press.

### ***Correct Form Uniquely Stimulates Muscular Contraction***

Like most training methods, plyometrics must be done correctly to be effective. With plyometric training, that means the movement must be performed very rapidly to efficiently stretch the trained muscle during the eccentric phase. In addition, the concentric contraction must instantaneously follow the eccentric phase.<sup>1</sup>

The quick stretch of the muscle tissue during the eccentric phase of plyometric training triggers certain sensors within muscle tissue known as proprioceptors that reflexively boost muscular contraction force during the concentric phase.<sup>2</sup> One of the proprioceptors activated by rapid muscle stretching during plyometric training is the muscle spindle, which detects the quick elongation of the muscle and initiates muscular contraction to prevent further stretching and possible muscle damage.

The second proprioceptor influenced by plyometrics is the Golgi tendon organ (GTO), which typically prevents central nervous system (CNS) activation of muscular contraction, specifically when the muscle is contracting very forcefully to also prevent muscle damage. However, the quick lengthening of the muscle from plyometric training actually inhibits the GTO, which ultimately boosts CNS-activated muscular contraction during the concentric phase.<sup>2,3</sup>

### ***Greater Gains in Size and Strength***

Enhanced muscular contraction during the concentric phase from plyometric work will conceivably contribute to gains in muscle size and strength on its own. However, the most powerful training effect from plyometric movements stems from the substantial increase in CNS-activated



muscular contraction, which not only improves power but should also yield greater gains in size and strength—as enhanced power production stresses the muscle tissue. In fact, several studies show that plyometric training effectively increases muscular contraction intensity due to an increase in neural recruitment of additional muscle fibers<sup>4,5</sup>, which enhances size, strength and power<sup>6,7</sup>—thus validating the notion that increased power from plyometric training can drive strength and hypertrophic gains.

## A Boost in Muscle Power

Because resistance exercise increases the size and contraction force of individual muscle fibers, while plyometric training primarily increases the quantity of muscle fibers contributing to muscular contraction, combining plyometrics with weight training should provide a synergistic increase in contractile forces by making each individual muscle fiber stronger—while simultaneously increasing the activation of these larger, more powerful muscle fibers, resulting in superior strength production. In fact, several studies have confirmed that plyometric training combined with weight training produced superior gains in muscle strength and power, relative to using either training method alone.<sup>8,9</sup>

## A Complement to Weight Training for Increased Muscle Size

Despite the common belief that plyometric training only bolsters muscle strength and power but not much muscular growth, several studies have actually demonstrated that plyometric training induces considerable muscle hypertrophy, particularly when combined with lifting weights. A study by Kubo et al.<sup>8</sup> showed that 12 weeks of plyometric work induced a significant increase of five percent in muscle size in the lower leg, and this effect was similar to the muscle growth stimulated by a 12-week weight-training program. A second study<sup>10</sup> reported that combining plyometrics with resistance training generates a large increase in fast-twitch muscle fiber size of approximately 20 percent within the upper leg. Overall, these data reveal that plyometric training, alone or in combination with resistance training, can trigger muscle growth, and the muscle-building effects of plyometric training appear to be enhanced when combined with intense weightlifting—making plyometrics a complementary approach to standard weight training.

## Plyometrics for a Jump in Testosterone

Steroid hormones, such as testosterone, play a key role stimulating muscle growth in response to resistance training. In order to see if combining resistance exercise with plyometric training, or complex training, might produce greater muscle growth by boosting levels of the anabolic hormone testosterone, a study by Beaven et al.<sup>11</sup> compared the influence of combining plyometric training with weights on serum testosterone levels, relative to performing resistance training alone. The results of the study showed that

**FORGET THE FALSE NOTION THAT PLYOMETRIC TRAINING IS JUST FOR THE ATHLETE. IT'S FOR ANYONE WANTING TO GET BIGGER, STRONGER AND MORE POWERFUL!**

subjects performing resistance training that involved heavy box squats followed by plyometric jump squats had the largest spike in serum testosterone levels of 13 percent. This hormonal response after the strength-plyometric bout suggests that this exercise sequence, resistance work followed by plyometrics, provides a superior anabolic environment that conceivably supports greater muscle growth.

## Get Bigger, Stronger and More Powerful

There are essentially two major types of muscle fiber; slow-twitch and fast-twitch fibers, where the fast-twitch fiber contracts roughly four times faster than slow-twitch fibers<sup>12</sup>, giving the fast-twitch fiber a greater force-producing capacity. Several animal studies have shown that plyometric training can increase the amount of fast-twitch muscle fibers by actually transforming slow-twitch fibers into fast-twitch fibers.<sup>13,14,15</sup> Another investigation by Malisoux et al.<sup>16</sup> also found a significant increase in the proportion of fast-twitch muscle fibers in the lower leg muscles

of humans after performing lower body plyometric training.

Collectively, the results of these studies show that plyometric training can increase the composition of fast-twitch muscle fibers, which likely increases strength and power because of the fibers' greater force-producing capabilities, representing an additional performance-enhancing effect associated with plyometric training.

In summary, superior muscle strength and power bestows greater athletic ability along with enhanced function in the weight room, ultimately promoting greater muscle mass and strength. The use of plyometric training, especially when combined with resistance work, potentially enhances performance in the weight room, which includes immediate gains in muscle power production that will eventually produce remarkable gains in muscle size and strength. So, forget the false notion that plyometric training is just for the athlete. It's for anyone wanting to get bigger, stronger and more powerful! ■

## REFERENCES:

1. Bosco C, Viitasalo JT, et al. Combined effect of elastic energy and myoelectrical potentiation during stretch-shortening cycle exercise. *Acta Physiol Scand* 1982;114, 557-565.
2. Wilt F. Plyometrics, what it is and how it works. *Athl J* 1975; 55, 76-90.
3. Swash M and Fox KP. Muscle spindle innervation in man. *J Anat* 1972;112, 61-80.
4. Wu YK, Lien YH. Relationships between three potentiation effects of plyometric training and performance. *Scand J Med Sci Sports* 2009;20, e80-86.
5. Moritani T. Neuromuscular adaptations during the acquisition of muscle strength, power and motor tasks. *J Biomech* 1993;26 Suppl 1, 95-107.
6. Kubo K, Morimoto M, et al. Effects of plyometric and weight training on muscle-tendon complex and jump performance. *Med Sci Sports Exerc* 2007;39, 1801-1810.
7. Potteiger JA, Lockwood RH and Haub M.D. Muscle power and fiber characteristics following 8 weeks of plyometric training. *J Strength Cond Res* 1999;13, 275-279.
8. Ford HT Jr., Puckett JR, et al. Effects of three combinations of plyometric and weight training programs on selected physical fitness test items. *Percept Mot Skills* 1983;56, 919-922.
9. Bauer T, Thayer RE, et al. Comparison of training modalities for power development in the lower extremity. *J Appl Sport Sci Res* 1990;4, 115-121.
10. Hakkinen K, Komi PV and Alen M. Effect of explosive type strength training on isometric force- and relaxation-time, electromyographic and muscle fiber characteristics of leg extensor muscles. *Acta Physiol Scand* 1985;125, 587-600.
11. Beaven CM, Gill ND, et al. Acute salivary hormone responses to complex exercise bouts. *J Strength Cond Res* 2011;25, 1072-1078.
12. Malisoux L, Francaux M, et al. (2006) Stretch-shortening cycle exercises: an effective training paradigm to enhance power output of human single muscle fibers. *J Appl Physiol* 1985; 100, 771-779.
13. Pousson M, Perot C and Goubel F. Stiffness changes and fibre type transitions in rat soleus muscle produced by jumping training. *Pflugers Arch* 1991;419, 127-130.
14. Almeida-Silveira MI, Perot C, et al. Effects of stretch-shortening cycle training on mechanical properties and fibre type transition in the rat soleus muscle. *Pflugers Arch* 1994;427, 289-294.
15. Watt PW, Kelly FJ, et al. Exercise-induced morphological and biochemical changes in skeletal muscles of the rat. *J Appl Physiol Respir Environ Exerc Physiol* 1982;53, 1144-1151.
16. Malisoux L, Francaux M, et al. Calcium sensitivity of human single muscle fibers following plyometric training. *Med Sci Sports Exerc* 2006;38, 1901-1908.





# LIVE.

This is training for life. It's what we do. So live right, strive and truly succeed. Want to achieve your fitness goals? Balance is key.<sup>†</sup>



# PLAY.

It's what we love to do. So play harder with NO2 Black Full Cycle<sup>®</sup> and Black Powder Ultra<sup>®</sup>. They help you impact the full cycle of training performance by boosting energy, endurance and power.<sup>†</sup>



# REPEAT >

It's what we thrive on. Figuring out what works, hitting our goals and then repeating everything as we strive for the next level. Over and over again.<sup>†</sup>

  > Learn more at [mri-performance.com/play](http://mri-performance.com/play)

<sup>†</sup> These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease. © 2015 MRI (Medical Research Institute)





**AMAZING  
TASTE!**



**FLEXIBLE FORMULA!**

Active Individuals

**20g** **4.5g**

WHEY PROTEIN  
IN 1 SCOOP

BCAAs

Serious Trainers

**40g** **9g**

WHEY PROTEIN  
IN 2 SCOOPS

BCAAs

**0**

ASPARTAME  
& TRANS FAT

MADE IN THE  
**USA**  
FROM DOMESTIC &  
INTERNATIONAL  
INGREDIENTS

# BEST PROTEIN VALUE IN AMERICA

## PREMIUM PROTEIN AT A SAM'S CLUB PRICE

You deserve a premium protein without the premium price. Powered by instantized, ultra-filtered whey for easy mixing and amazing taste, Premium Whey Protein Plus delivers the best-in-class formula you deserve, at a value price you want! And since it's from the makers of MuscleTech®, you get an enhanced formula for incredible results. Build the body you want without spending a fortune. **Get Premium Whey Protein Plus at your local Sam's Club!**

- Builds lean muscle better than regular whey<sup>1</sup>
- Accelerates recovery after exercise
- Tastes amazing and mixes instantly

Available at



<sup>1</sup>Subjects combining the core ingredients in MuscleTech® Premium Whey Protein Plus (creatine and whey protein) with a weight training program gained 70% more lean muscle than subjects using regular whey protein (8.8 vs. 5.1 lbs.). Read label before use. © 2015



# FitRx Cool DOWN

● THE BEST IN TRAINING, NUTRITION, HEALTH, AND SUPPLEMENTATION INFORMATION

**84** CROSSFIT  
REVOLUTION

## IN THIS SECTION

**70**

FAT ATTACK

**74**

CARDIO  
BURN

**76**

HARD 'CORE'  
TRAINING

**84**

CROSSFIT  
REVOLUTION

**88**

SUPPLEMENT  
EDGE

**92**

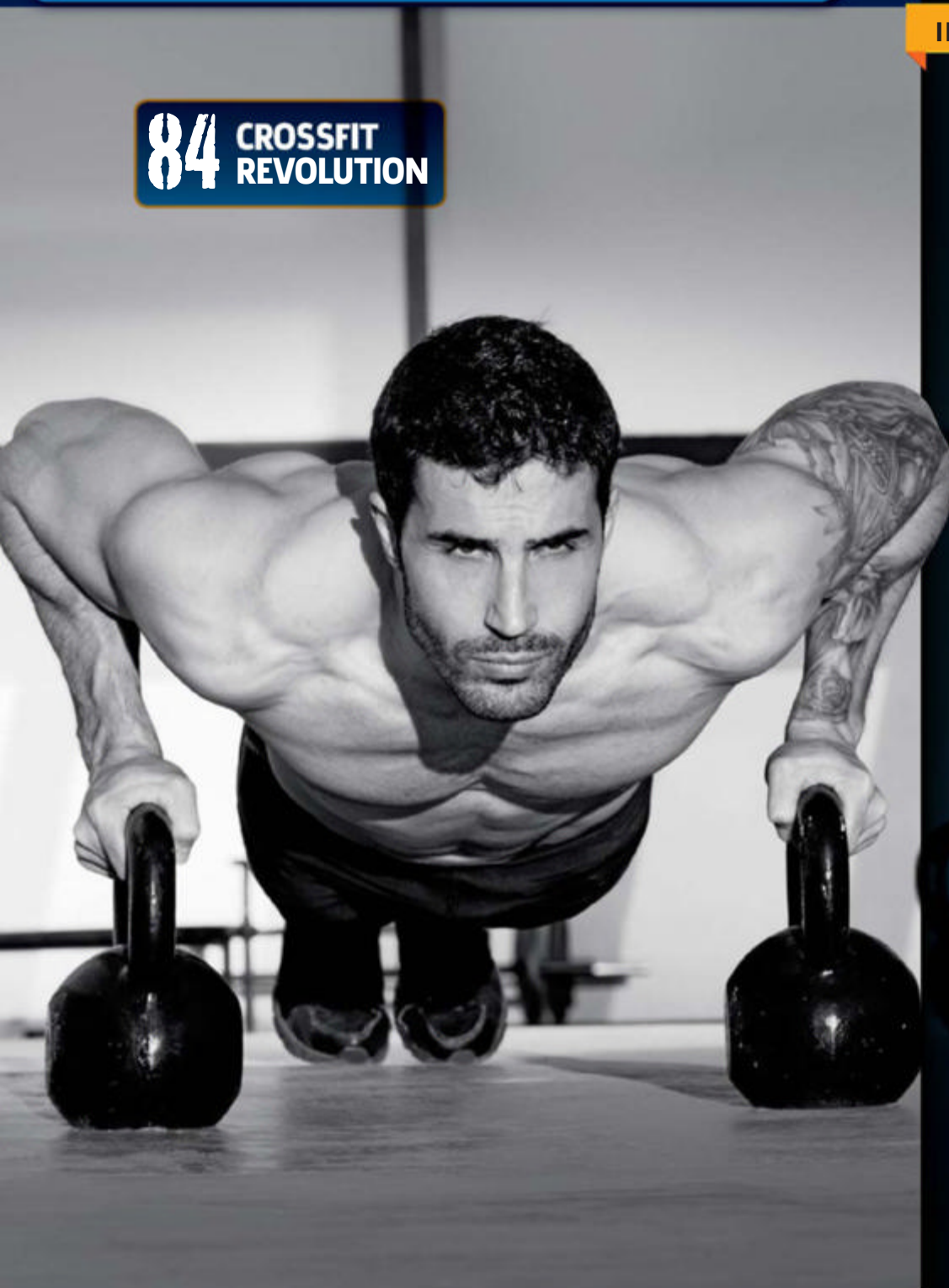
MEN'S  
HEALTH

**94**

ULTIMATE IN  
NUTRITION

**98**

GET FIT  
WITH PLITT





## FAT-LOSS SUPPLEMENTS

## WHAT WORKS &amp; WHAT DOESN'T

The supplement industry is bursting with fat-loss supplements. At least you, as a FitnessRx reader, realize that hard work in the gym is a crucial component of getting lean. You know that burning fat is going to require some dietary modifications (i.e., calorie restriction, reduced carbohydrates, nutrient timing). You can appreciate the importance of fasted morning cardio and the concept that “sweat is fat crying.”

Dieting does result in metabolic adaptations that may be counterproductive to your goals. As we go into any caloric deficit to burn fat, our bodies try to adjust by slowing down our metabolism and conserving energy. This is where “fat-loss” supplements can be of assistance. We know that there isn't a magic pill that will let us sit on our asses and eat burgers while getting lean. However, we do have supplements that can augment our diets and improve our metabolism.

Dietary supplements can improve our weight-loss objectives through a number of mechanisms:

1. Suppression of appetite
2. Impairing fat absorption
3. Increased fat oxidation during exercise
4. Increasing resting energy expenditure (turning on brown fat and thermogenesis)
5. Promoting mobilization and metabolism of fats

The main mechanism for enhancing most of these objectives in our bodies is the activation of the sympathetic nervous system (SNS). The SNS is the system that produces adrenalin (epinephrine) and noradrenalin (norepinephrine, NE). We all know the power of the SNS when we experience the “fight or flight” response of fear or excitement during a competition. Your heart starts to pound, you get sweaty and the last thing on your mind is food. This is the mechanism that



***There isn't a magic pill that will let us sit on our asses and eat burgers while getting lean. However, we do have supplements that can augment our diets and improve our metabolism.***

many successful fat-loss supplements try to harness.

One of the most effective supplements of all time was the “ECA stack,” God rest its soul. ECA stands for ephedra, caffeine and aspirin. Unfortunately, this very effective and synergistic combination of compounds is no longer legal since the U.S. Food and Drug Administration (FDA) crackdown on ephedrine. The premise of the combo was to hit the SNS from multiple angles.<sup>1</sup> Ephedrine stimulated

the release of NE, just like exercise and fear. Caffeine and other alkaloids (theobromine, theophylline, etc.) prevent the NE signal from being turned off. The aspirin inhibits the formation of prostaglandins that can modulate the action of NE. Other compounds can prevent the breakdown of NE (polyphenols like green tea catechins inhibit COMT, or catechol-O-methyltransferase) or further turn on the signal from NE on its target tissues like the fat cell, muscle and heart (forskolin, xanthines).

Supplements also try to turn on our metabolism by specifically “turning up the heat.” Our bodies have a tissue called “brown fat” or brown adipose tissue; BAT for short. BAT is much more metabolically active than the “white adipose tissue” that creates our insulation and spare tires. BAT burns fat to release energy in the form of heat. Many scientists are searching for ways to turn on BAT to improve fat-burning metabolism. Fortunately, we can turn on BAT with environmental changes (lower the room temperature), food changes (eat more protein) and supplements (capsaicinoids, melatonin, etc.).

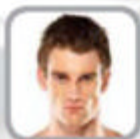
Other supplements say they turn on thyroid hormone, reduce conversion of sugars to fats, and decrease the absorption of fats or sugar. In the remainder of this article, I will lay out some data on common and up-and-coming fat-loss supplements. As we move forward, it is important to understand that research in animals does not always translate to an effect in humans.

### CAFFEINE

Everyone knows what caffeine can do to them. Who hasn't tried a Starbucks coffee? If you've ever tried a fat-burning supplement, you have likely had some pure caffeine. Caffeine from tea and coffee may



**NEW!**



**ROB WASLOWSKI**  
EPIQ™ ATHLETE  
@robwaslowski

**MUSCLEBUILDING  
BREAKTHROUGH!**

# DOUBLE THE GAINS

**EPIQ™ PHOSPHATIDIC ACID delivers a full clinical dose of patented Mediator® PA.**

All-new PHOSPHATIDIC ACID from EPIQ™ is one of the most advanced musclebuilding formulas available, delivering double the muscle gains and boosting strength by 60%! Its potent 750mg dose of the purest, most bioavailable form of oral phosphatidic acid – Mediator® PA – helps you maintain elevated PA levels for hours for unbelievable musclebuilding results! Only patented Mediator® PA is certified for the highest purity with a highly specialized testing procedure known as nuclear magnetic resonance (NMR) spectroscopy – so don't settle for generic, under-dosed formulas with questionable ingredients. Get real results with the only patented form of PA that's delivered in every serving of EPIQ™ PHOSPHATIDIC ACID.

**Get it exclusively at GNC.**

## LEAN BODY MASS GAINED AFTER 8 WEEKS (LBS.)

The phosphatidic acid group gained 2x the muscle as the placebo group after 8 weeks.



- **2X THE MUSCLE GAINS – SUBJECTS GAINED 5.3 LBS. OF MUSCLE IN 8 WEEKS**
- **60% STRENGTH INCREASE**
- **FEATURES THE PUREST FORM OF PHOSPHATIDIC ACID**



AVAILABLE EXCLUSIVELY AT

**GNC**  
LIVE WELL

**Lucky Vitamin**  
The Internet's Pot of Gold for Nutrition and Wellness

**RITE AID** **GNC Live Well**  
in Select Rite Aid Locations

**EPIQRESULTS.COM**

Read label before use. © 2015.



provide added benefit from the other active polyphenols that may have fat-burning benefits as well (see below). If nature put caffeine and catechin polyphenols in the same package (tea), then why not put them together in a supplement? Caffeine, alone or in combination with green tea catechins, dose-dependently increases energy expenditure and fat oxidation.<sup>2</sup>

Caffeine may be one of the most-studied thermogenic compounds. It stimulates the SNS, controls appetite, mobilizes fats from stores and increases fat oxidation.<sup>3,4</sup> The main problem with caffeine is that we very quickly become desensitized to its effects.<sup>5</sup> Those who regularly drink a Venti coffee at Starbucks are not likely to see its beneficial effects on weight loss. I would suggest that if you want caffeine to work in your favor, limit your exposure to it in the off-season. The chlorogenic acids from green coffee bean extract may also provide a fat-burning effect, although the jury is still out.<sup>18</sup>

### GREEN TEA CATECHINS

As mentioned earlier, the polyphenols from teas like green tea have powerful effects on fat burning. Catechins in tea inhibit the enzyme COMT that is present ubiquitously in the body, and degrades SNS compounds such as NE.<sup>4</sup> Through this inhibition of COMT, the SNS activity of NE remains activated. Thus, the catechins keep the actions of caffeine and exercise "revving" longer.

The problem with green tea extracts is when the most active catechin, epigallocatechin gallate (EGCG), is super concentrated. Many supplements overdose concentrated versions of EGCG. Recent studies suggest that the liver toxicity attributed to certain dietary supplements may have been a result of high EGCG concentrations.<sup>6</sup> However, the dosages found in unconcentrated regular green teas do not seem to be toxic. This is probably just a case of too much of a good thing going bad. Use caution when using green tea extracts high in EGCG; if you have liver issues, ask your hepatologist first.

### SYNEPHRINE

Synephrine, often referred to as bitter orange extract, is a fat burner with similar actions as ephedrine. It has had the dubious task of replacing ephedrine in dietary supplements. Unfortunately, synephrine isn't quite as strong as ephedrine. Despite this inferiority complex, synephrine is beneficial as an ingredient in your fat-burning supplement.

In a randomized, double-blinded placebo-controlled study, 50 milligrams of synephrine produced a 65-calorie increase in resting metabolic rate without any significant effects on heart rate or blood pressure.<sup>7</sup> In the same study, scientists also tried combining two

other citrus bioflavonoids (hesperidin and naringin) with synephrine to observe any synergistic effects. The consumption of 600 milligrams of naringin with 50 milligrams of synephrine resulted in a 129-calorie increase in metabolic rate. In the group receiving 100 milligrams of hesperidin with 50 milligrams of synephrine, plus 600 milligrams of naringin, the metabolic rate increased by 183 calories—an increase that was statistically significant with respect to the placebo control.

### PEPPER EXTRACTS (CAPSAICINIDS)

Ever watch someone sweat while eating Three Mile Island hot wings at Hooters? I have, and the thermogenesis is unmistakable. Hot peppers make us sweat, and sweat is fat crying, right? Science supports the use of cayenne pepper extracts (standardized for capsaicinoids) in our fat-burning supplements.

In particular, capsaicin, the major pungent compound of red chili pepper, is a thermogenic ingredient that stimulates energy expenditure.<sup>8</sup>

***Capsaicin may actually be able to turn on genes in white "storage" fat, that cause it to convert to fat-burning brown fat.***

Capsaicin increases fat oxidation, limits appetite and increases energy expenditure. Although some of these effects appear to be through SNS stimulation, again, capsaicin has little effect on blood pressure. Interestingly, capsaicin supplementation appears to limit the decline in metabolism that occurs with calorie-restricted dieting.<sup>8</sup>

Beyond the well-studied effects mentioned above, capsaicin also appears to augment fat burning through other mechanisms. It is clear that capsaicin turns on metabolism through activation of brown fat.<sup>9</sup> More fascinating is that an animal model suggests that capsaicin may actually be able to turn on genes in white "storage" fat, that cause it to convert to fat-burning brown fat. It has also been suggested that capsaicin can alter the gut microbiota (much like probiotics) to help induce a fat-burning animal. *The power of probiotics as a fat burner will be a topic of future articles.*

Black pepper isn't quite as hot as chili peppers, and isn't even a true pepper (it's a spice), but it too has valuable metabolic effects through its constituent, piperine. Piperine is a pungent component of black pepper, much like capsinoids are with chilis, albeit much lower on the Scoville scale. Piperine is thought to exert some of its beneficial effects via mechanisms similar to capsaicin. In mice fed a high-fat

and high-sugar diet, investigators found diets with up to 0.05 percent piperine and one percent black pepper resulted in significantly less fat accumulation over four weeks.<sup>10</sup> In another study with rats fed a similar diet with piperine, the treatment group experienced lower blood pressure, improved glucose levels, less oxidative stress, less inflammation and improved liver function.<sup>11</sup> These findings suggest that piperine may be of value in burning fat while cutting, or it may even prevent accumulating fat during bulk dieting.

### KAEMPFEROL

Kaempferol is a small polyphenolic flavonoid found in broccoli, spinach and berries. It appears to increase energy expenditure through thyroid hormone activation. It appears to do this through enhancing the conversion of the less active T4 to the very active T3 molecule. This mechanism has been demonstrated in the laboratory through its actions on the enzyme deiodinase in human muscle cell cultures.<sup>12</sup> Furthermore, studies in cancer cells show that flavonoids like kaempferol and quercetin (quercetin being the strongest) are very strong inhibitors of fatty acid synthase.<sup>13</sup> Could this translate to your cruciferous vegetables helping you to burn fat? The fiber alone will help you absorb less fat, so eat your veggies!

### URSOLIC ACID

This compound has been known to have fat-burning and muscle-increasing effects. Ursolic acid appears to be an amazing compound in rodents, one that increases muscle mass while keeping fat at bay. A recent study in humans supplemented 450 milligrams of ursolic acid (from rosemary) in three divided doses of 150 milligrams, with meals, over the course of eight weeks in weight-trained subjects.<sup>14</sup> Researchers found increased serum irisin (12%) and IGF-1 (22.8%) more than placebo, but no changes in body composition. They did find improvements in strength, however. It would be interesting to see if this compound would help maintain muscle mass when dieting.

### FATTY ACIDS

The effects of various fatty acids on your metabolism are astounding. Some fats are stored easier than others, whereas others possess a thermic effect and burn efficiently. Fish oils, CLA and MCT oils have all been shown to be effective mediators of fat storage and metabolism.<sup>1</sup> The science is mixed, but healthy fats such as these may play an important role in your fat-burning supplementation. A meta-analysis of the effects of CLA supplementation showed that 3.2 grams per day can produce modest fat loss.<sup>15</sup> It is important to note that when using



- 550 Stores Nationwide
- HarborFreight.com 800-423-2567





# Does Fasted Cardio **MAXIMIZE FAT LOSS?**

One of the most popular strategies for accelerating fat loss is to perform aerobic exercise after an overnight fast. The strategy, first popularized by Bill Phillips in his best-seller *Body for Life*, is based on acute research showing that low glycogen levels cause your body to shift substrate utilization away from carbs, thereby allowing greater mobilization of stored fat for energy.

Indeed, some studies have shown that consumption of carbohydrate prior to engaging in aerobic exercise reduces entry of long-chain fatty acids into the mitochondria, thus inhibiting fat oxidation.<sup>1,6,9,5</sup> Here's the kicker, though: results are specific to low-intensity cardio. While fat breakdown is accelerated during fasted high-intensity cardio, the amount of available fatty acids exceeds the body's ability to use them for fuel.<sup>3,7</sup> Hence, the common practice of performing HIIT while fasted is actually counterproductive from a fat-burning standpoint.

While acute research would seem to suggest a potential benefit to performing fasted cardio—at least at lower intensities—there's one not-so-little problem when attempting to extrapolate results into practice: namely, the amount of fat burned during exercise does not necessarily reflect actual fat loss. Understand that the human body continually adjusts its use of substrate in accordance with a multitude of factors that can change from moment to moment.<sup>14</sup>

Take home point: Fat burning must be

evaluated over the course of days—not on an hourly basis—to truly understand its effect on body composition.<sup>5</sup>

## THE STUDY

Recently, my lab sought to determine whether fasted cardio actually promoted differences in fat loss over time. Twenty recreationally trained college-aged women were randomly assigned to either a fasted training (FASTED) group that performed exercise after an overnight fast or a non-fasted training (FED) group that consumed a meal prior to exercise. On training days, the morning meals were consumed in the form of a shake that provided 40 grams of carbs and 20 grams of protein. These meals were ingested under the supervision of the research team to ensure that subjects adhered to either the FASTED or FED conditions.

The training protocol consisted of one-hour sessions of supervised steady-state treadmill exercise performed at 70 percent of maximal heart rate—an intensity that equated to a fast walk/jog. The low-intensity nature of the protocol ensured that any fat-burning advantages associated with fasted cardio would translate into greater improvements in body composition. Training was carried out three days per week for four weeks.

To help control food intake and thus optimize fat loss, subjects were given customized meal plans designed to create a 500-calorie deficit. The meal plans provided a balance of carbs (~45%), protein (~30%) and fats (25%), and allowed ample ability for the subjects to choose their pre-

ferred foods. Subjects recorded their daily food consumption in an online journal for continual monitoring of nutritional intake. Nutritional counseling was provided throughout the study period to enhance dietary adherence.

The results were somewhat surprising: Although both groups lost a significant amount of weight and body fat, no differences were noted between conditions in any body composition measure. Adherence to the program was excellent, with average attendance equating to more than 95 percent of total sessions.

## THE THERMIC EFFECT OF EXERCISE, AND FAT STORES

The discrepancies between acute and long-term findings can be explained by the fact that consuming a meal before exercise increases a phenomenon termed the thermic effect of exercise (TEE). The influence of performing cardio in the fed state on TEE was demonstrated in a crossover study by Paoli et al,<sup>12</sup> where subjects participated in two separate treatment conditions: On one occasion the subjects performed a bout of moderate-intensity cardio after eating; in the other they performed the same exercise protocol after an overnight fast. Meals were individually prepared by the researchers so the total quantity of food and macronutrient ratio did not differ between conditions. Results showed a greater utilization of fat as a fuel source following exercise in the fed condition, with differences remaining significant 24 hours post-workout. Similar results have been reported by other researchers.<sup>2,4,11</sup>

**FAT BURNING MUST BE EVALUATED OVER THE COURSE OF DAYS—NOT ON AN HOURLY BASIS— TO TRULY UNDERSTAND ITS EFFECT ON BODY COMPOSITION**



although a recent study contradicts these findings.<sup>10</sup>

It's also important to consider the location of fat stores mobilized during training. From an aesthetic standpoint, the only fat loss that really matters is from subcutaneous (i.e., underneath the skin) depots. However, only a little more than half of the fat burned during training is derived subcutaneously; the balance comes from intramuscular triglycerides (IMTG).<sup>16</sup> IMTG are stored as lipid droplets in the sarcoplasm of the muscle and their close proximity to the mitochondria facilitates their ability to be used on-demand during exercise.<sup>13</sup> As might be expected, the body adapts to performance of regular exercise by increasing utilization of IMTG, thus sparing carbohydrate for potential anaerobic needs. Studies show that the reliance on IMTG for fuel in aerobically trained individuals is almost twice that of those who are untrained,<sup>13,17</sup> with the contribution of IMTG stores rising to approximately 80 percent of total body fat utilization during 120 minutes of moderate intensity endurance training.<sup>8</sup> The take home point here is that acute studies do not distinguish between subcutaneous fat and IMTG, and thus the net effect of increasing fat utilization during training becomes increasingly less relevant with long-term aerobic adherence.

## STUDY LIMITATIONS

So does this mean that there is no benefit to performing fasted cardio? Not necessarily.

A couple of study limitations need to be taken into account when attempting to draw evidence-based conclusions. For one, the study was of relatively short duration, spanning only four weeks. While this period of time was sufficient to achieve significant fat loss, it remains possible that very slight differences between conditions might take longer to manifest.

Moreover, the findings are specific to young, recreationally trained women and cannot necessarily be generalized to hard-training physique athletes. It has been postulated that the true benefit of fasted cardio is specific to those with low levels of body fat (e.g., pre-contest bodybuilders) who are trying to lose that last pound or two of stubborn fat. Whether this outcome plays out in practice is yet to be determined.

## THE BOTTOM LINE

It appears clear that if there are in fact any benefits from fasted cardio, they would be minor at best. Although it remains possible that lean individuals might see small but potentially meaningful benefits on fat loss from performing exercise prior to a morning meal, the strategy just as

easily could have a negative impact on fat burning via a reduced TEE. When considering all the evidence, the best advice here would be to experiment with both strategies and try to objectively determine what works best for you as an individual. ■

Brad Schoenfeld, Ph.D., CSCS, FNSCA is widely regarded as one of the leading authorities on training for muscle development and fat loss. He has published over 60 peer-reviewed studies on various exercise- and nutrition-related topics. He is also the author of the best-selling book, *The M.A.X. Muscle Plan*, and runs a popular website and blog at [www.lookgreatnaked.com](http://www.lookgreatnaked.com).

## References:

1. Ahlborg, G, and Felig, P. Influence of glucose ingestion on fuel-hormone response during prolonged exercise. *J. Appl. Physiol.* 41: 683-688, 1976.
2. Davis, JM, Sadri, S, Sargent, RG, and Ward, D. Weight control and calorie expenditure: thermogenic effects of pre-prandial and post-prandial exercise. *Addict. Behav.* 14: 347-351, 1989.
3. Febbraio, MA, Chiu, A, Angus, DJ, Arkinstall, MJ, and Hawley, JA. Effects of carbohydrate ingestion before and during exercise on glucose kinetics and performance. *J. Appl. Physiol.* 89: 2220-2226, 2000.
4. Goben, KW, Sforzo, GA, and Frye, PA. Exercise intensity and the thermic effect of food. *Int. J. Sport Nutr.* 2: 87-95, 1992.
5. Hansen, K, Shriver, T, and Schoeller, D. The effects of exercise on the storage and oxidation of dietary fat. *Sports Med.* 35: 363-373, 2005.
6. Horowitz, JF, Mora-Rodriguez, R, Byerley, LO, and Coyle, EF. Lipolytic suppression following carbohydrate ingestion limits fat oxidation during exercise. *Am. J. Physiol.* 273: E768-75, 1997.
7. Horowitz, JF, Mora-Rodriguez, R, Byerley, LO, and Coyle, EF. Substrate metabolism when subjects are fed carbohydrate during exercise. *Am. J. Physiol.* 276: E828-35, 1999.
8. Hurley, BF, Nemeth, PM, Martin, WH, 3rd, Hagberg, JM, Dalsky, GP, and Holloszy, JO. Muscle triglyceride utilization during exercise: effect of training. *J. Appl. Physiol.* (1985) 60: 562-567, 1986.
9. Ivy, JL, Miller, W, Dover, V, Goodyear, LG, Sherman, WM, Farrell, S, and Williams, H. Endurance improved by ingestion of a glucose polymer supplement. *Med. Sci. Sports Exerc.* 15: 466-471, 1983.
10. Iwayama, K, Kawabuchi, R, Park, I, Kurihara, R, Kobayashi, M, Hibi, M, Oishi, S, Yasunaga, K, Ogata, H, Nabekura, Y, and Tokuyama, K. Transient energy deficit induced by exercise increases 24-h fat oxidation in young trained men. *J. Appl. Physiol.* (1985) 118: 80-85, 2015.
11. Lee, YS, Ha, MS, and Lee, YJ. The effects of various intensities and durations of exercise with and without glucose in milk ingestion on postexercise oxygen consumption. *J. Sports Med. Phys. Fitness* 39: 341-347, 1999.
12. Paoli, A, Marcolin, G, Zonin, F, Neri, M, Sivieri, A, and Pacelli, QF. Exercising fasting or fed to enhance fat loss? Influence of food intake on respiratory ratio and excess postexercise oxygen consumption after a bout of endurance training. *Int. J. Sport Nutr. Exerc. Metab.* 21: 48-54, 2011.
13. Romijn, JA, Coyle, EF, Sidossis, LS, Gastaldello, A, Horowitz, JF, Endert, E, and Wolfe, RR. Regulation of endogenous fat and carbohydrate metabolism in relation to exercise intensity and duration. *Am. J. Physiol.* 265: E380-91, 1993.
14. Sonko, BJ, Fennessey, PV, Donnelly, JE, Bessesen, D, Sharp, TA, Jacobsen, DJ, Jones, RH, and Hill, JO. Ingested fat oxidation contributes 8% of 24-h total energy expenditure in moderately obese subjects. *J. Nutr.* 135: 2159-2165, 2005.
15. Spriet, LL, and Watt, MJ. Regulatory mechanisms in the interaction between carbohydrate and lipid oxidation during exercise. *Acta Physiol. Scand.* 178: 443-452, 2003.
16. van Loon, LJ. Use of intramuscular triacylglycerol as a substrate source during exercise in humans. *J. Appl. Physiol.* (1985) 97: 1170-1187, 2004.
17. Watt, MJ, Heigenhauser, GJ, and Spriet, LL. Intramuscular triacylglycerol utilization in human skeletal muscle during exercise: is there a controversy? *J. Appl. Physiol.* (1985) 93: 1185-1195, 2002.

NEW!

# MAX POTENCY FOR INTENSE RESULTS



All-new MuscleTech® ANARCHY™ delivers your most hardcore workouts with hot new ingredients to deliver extreme pumps, explosive energy, intensity and focus:

- 1.5g patented Nitrosigline® for extreme muscle pumps!
- 3.2g CarnoSyn® beta-alanine for muscle- and strength-building!
- HydroMax™ glycerol – 10x more concentrated than glycerol monostearate

\*Per max dose

Get ANARCHY™ today for your most intense workouts ever!



THE SCIENCE OF PERFORMANCE

MUSCLETECH.COM

Facebook logo is owned by Facebook Inc. Read the entire label and follow directions. © 2015



# GET A TIGHT MIDSECTION

## *Insulin and Abdominal Fat*

If you gave up cheat days and drinking, slashed your calorie intake and cleaned up your food choices yet still can't seem to get rid of that stubborn fat anchored in your midsection, it may be time to take a closer look at when you're eating.

### PREVENT WEIGHT GAIN

New research from the Salk Institute for Biological Studies suggests time-restricted feeding (TRF), which confines food intake to an eight- to nine-hour period, may protect you from gaining weight and compromising your health, even when you dive into a day or two of bacon cheeseburgers, soda and doughnuts. Led by Dr. Satchidananda Panda, scientists placed mice on one of four diets: high fat, high sugar, high fat and high sugar or a control diet for 38 weeks while giving them either unlimited access to their food or a time window of nine, 12 or 15 hours during which they were allowed to eat. To further evaluate how feeding time influences bodyweight, some of the mice in the TRF groups were allowed to eat whenever they wanted on weekends while some mice in the eat-whenever group were shifted to a restricted schedule partway through the study.

Though calorie intake was the same among all groups of mice and they were placed on diets that would, in theory, always lead to obesity, the mice that ate whenever they wanted were obese and ill at the end of the study while those who were restricted to a nine- or 12-hour feeding period, including the subset of mice who ate whenever they wanted on weekends, were slimmer and had lower cholesterol than the anytime-feeding group. In fact, the more hours of time feeding was restricted, nine versus 12, the better their results. Plus, the mice originally allowed to eat anytime but then converted to TRF during the study actually lost some of the weight they gained when eating ad lib.

In an earlier study, the same group of scientists found mice who were placed on a TRF schedule, eating only during an eight-hour window over the course of the day when they were most active, were less likely to become obese than mice who ate throughout the day and night. Both groups consumed the same amount of calories from their high-fat diet and neither group exercised.



***Could it be time to throw out the protein-packed pancake mix, low-carbohydrate bars and calorie-logging apps and simply eat by the clock?***

Restricting the time during which they could eat improved their ability to use nutrients and burn calories while protecting the mice from obesity, high insulin levels, fatty liver and inflammation while improving mTOR, the pathway that turns on muscle growth.

### CONTROLLING SATIETY AND INSULIN

The results from this lab in California are enticing and suggest that what we eat may matter less than when we are eating. Could it be



**fuel:one™**

**NEW**

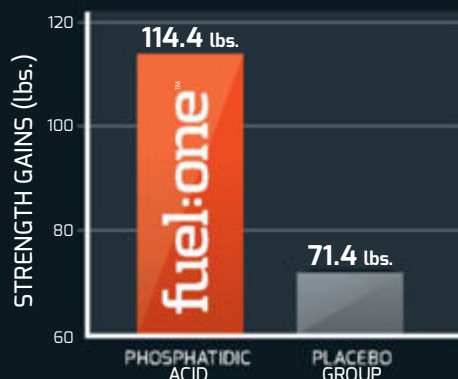
# TOTAL MUSCLEBUILDING: fuel

## Advanced Musclebuilding Breakthrough from The University of Tampa

Build twice as much muscle with ALL-NEW fuel:one™ PHOSPHA BUILD, which packs a clinical dose of the world's purest form of phosphatidic acid – patented Mediator® PA. Studied at The University of Tampa, this groundbreaking compound helped test subjects put on 5.3 lbs. of muscle – double that of the placebo group! – and jack up leg press strength by 60% in just 8 weeks. And because PHOSPHA BUILD is certified for the highest purity using a highly specialized testing procedure, you know it's an effective formula that delivers results. What you get:

- **DOUBLE THE MUSCLE – SUBJECTS GAINED 5.3 LBS. OF MUSCLE IN 8 WEEKS**
- **60% MORE STRENGTH BASED ON UNIVERSITY OF TAMPA STUDY**
- **750mg OF THE HIGHEST PURITY MEDIATOR® PHOSPHATIDIC ACID**

### INCREASE STRENGTH BY 60%



#### STRENGTH GAINS ON 1-REP MAX LEG PRESS (LBS.)

The Phosphatidic Acid group gained 60% more strength on their 1-rep max leg press than the placebo group after 8 weeks (114.4 lbs. vs. 71.4 lbs.).



[fuelone.com](http://fuelone.com)



[fuelyourone](https://www.facebook.com/fuelyourone)



SPORTIKA

**GNC**  
LIVE WELL



time to throw out the protein-packed pancake mix, low-carbohydrate bars and calorie-logging apps and simply eat by the clock? While there is no research on calorie-controlled TRF and changes in bodyweight and fat in humans, there are some clues suggesting TRF may also work in other animals, including humans. And, the research team conducting these studies believes restricting food intake to a shorter time span during the day may better align with circadian rhythm, our body's physical, mental and behavioral changes that follow a 24-hour cycle in response to changes in light and darkness. Circadian rhythms influence sleeping, hormone release, body temperature and other body functions. In particular, circadian rhythms affect the targets of many diets—satiety hormones and the fat-regulating hormone insulin.

Satiety refers to feelings of fullness, which prevent overeating due to hunger pangs. Plenty of research has been devoted to regulating satiety by altering meal size, meal frequency and type of food consumed. And though targeting satiety makes sense so you can feel full on fewer calories, improved satiety does not always translate to a decrease in food intake or changes in bodyweight.

Insulin levels are largely regulated by carbohydrate intake and therefore, a plethora of diet books from the Paleo approach to South Beach, Atkins and more, have come up with ways to alter one's carbohydrate intake in an effort to help regulate insulin. The premise of all of these diets is an over-simplified take on physiology: eat carbohydrates, especially those with a high-glycemic index that are digested quickly, and your blood sugar will rise, signaling your pancreas to release insulin.

Insulin is a storage hormone that acts quickly to lower blood sugar by increasing uptake of sugar (glucose) by muscle and fat. Insulin also decreases the breakdown of fat in fat tissue while increasing the transport of the sugar from your doughnuts into fat cells—initiating the production of fat for storage. Constantly spike insulin levels by overeating high-carbohydrate meals and sitting around (if you are exercising when you consume carbohydrate your muscles will preferentially use the calories) and you'll store more body fat. And though the immediate

actions of insulin after a meal do not solely determine bodyweight, particularly in those with normal insulin functioning, the combination of consistent overproduction of insulin

## **Both sleep loss and sleep disturbances contribute to the development of insulin resistance, type 2 diabetes and being overweight.**

and consuming more calories than you need each day are a recipe for increasing body fat. Luckily, cutting carbohydrates might not be your only ticket to manipulating your body's insulin regulation. According to Dr. Panda's research, you may be able to do this through TRF.

### **SLEEP AND BODYWEIGHT**

Though there is no research on TRF in humans, support for this approach comes from research examining how eating at different times of the day and disrupting sleep impacts bodyweight. Both sleep loss and sleep disturbances contribute to the development of insulin resistance, type 2 diabetes and being overweight by disrupting blood sugar regulation, insulin release, increasing inflammation and altering appetite regulation. In fact, altering one's eating and sleep schedule by working the night shift increases risk of type 2 diabetes and abdominal obesity.

Furthermore, the Massachusetts Male Aging Study found that men who slept

less than six hours per night had an increased risk of alterations in blood sugar and increased incidence of type 2 diabetes compared with those who slept seven to eight hours per night. It shouldn't come as a surprise then that people who work the night shift have an increased risk of type 2 diabetes, being overweight and abdominal obesity (fat midsections). While fewer hours of sleep may directly influence blood sugar regulation and insulin, it also means more time awake and therefore, increased feeding time.

### **CONSIDER YOUR CARBS AND GET ADEQUATE SLEEP**

As we wait for research to examine if the results from Dr. Panda's TRF research can be replicated in humans, you may want to consider not just the amount and type of carbohydrates you are consuming but also, when you eat. Our bodies were built with their own internal clock that plays a vital role in keeping our waistlines trim and body healthy. Yet modern advances in entertainment and communication from cell phones to tablets to apps that let you talk to anyone in the world for free are constantly taking a toll on our sleep while interfering with this built-in clock that knows how to regulate biological systems better than any sleep-tracking device while also increasing the amount of time we have to eat during the day.

Do your body a favor by getting at least seven to nine hours of sleep and consider adopting a TRF schedule by starting to eat at breakfast and cutting yourself off after dinner less than 12 hours later. Doing this may help your body naturally regulate insulin sensitivity while also setting a natural time limit that forces you to curtail late-night mindless munching. ■

#### **References:**

- La Bounty PM, Campbell BI, Wilson J et al. International Society of Sports Nutrition position stand: meal frequency. *J Int Soc Sports Nutr* 2011;8:4.
- Bellisle F, McDevitt R, Prentice AM. Meal frequency and energy balance. *Br J Nutr* 1997;77 Suppl 1:S57-70.
- Verboeket-van de Venne WP, Westerterp KR. Influence of the feeding frequency on nutrient utilization in man: consequences for energy metabolism. *Eur J Clin Nutr* 1991;45(3):161-9.
- Smeets AJ, Westerterp-Plantenga MS. Acute effects on metabolism and appetite profile of one meal difference in the lower range of meal frequency. *Br J Nutr* 2008;99(6):1316-21.
- Taylor MA, Garrow JS. Compared with nibbling, neither gorging nor a morning fast affect short-term energy balance in obese

- patients in a chamber calorimeter. *Int J Obes Relat Metab Disord* 2001;25(4):519-28.
- Chaix A, Zarrinpar A, Miu P, Panda S. Time-Restricted Feeding Is a Preventative and Therapeutic Intervention against Diverse Nutritional Challenges. *Cell Metab* 2014;20(6):991-1005.
- Boden G, Ruiz J, Urbain JL, Chen X. Evidence for a circadian rhythm of insulin secretion. *Am J Physiol* 1996;271(2 Pt 1):E246-52.
- Gale JE, Cox CI, Qian J et al. Disruption of Circadian Rhythms Accelerates Development of Diabetes through Pancreatic Beta-Cell Loss and Dysfunction. *J Biol Rhythms* 2011;26(5):423-433.
- Macagnan J, Pattussi MP, Canuto R, Henn RL, Fassa AG, Olinto MT. Impact of nightshift work on overweight and abdominal obesity among workers of a poultry processing plant in southern Brazil. *Chronobiol Int* 2012;29(3):336-43.



# OWN BECOME GREATNESS IT

**GIANCARLO STANTON**  
ALL-STAR OUTFIELDER

**ROB GRONKOWSKI**  
ALL-PRO TIGHT END

**RUSSELL WESTBROOK**  
ALL-STAR POINT GUARD

**SIX STAR™**  
PRO NUTRITION



**Whey Protein Plus – The Choice of Elite Athletes**

- ▶ **60g of protein per 2 scoops** – ideal for flexible dosing
- ▶ **Enhanced with clinically proven muscle & strength builder** – delivers the results you want
- ▶ **Award-winning taste** – beats the competition hands down<sup>1</sup>

**#BecomeGreatness**

facebook.com/SixStar @SixStarPro sixstarpronutrition

**SixStarPro.com**

The American Masters of Taste, a prestigious panel of chefs and flavor experts, awarded Six Star Whey Protein Plus the Gold Medal for Superior Taste against all other value brands in America. <sup>1</sup>MuscleTech® is America's #1 Selling Body Building Supplement Brand based on cumulative wholesale dollar sales 2001 to present. Facebook logo is owned by Facebook Inc. Read the entire label and follow directions. © 2015

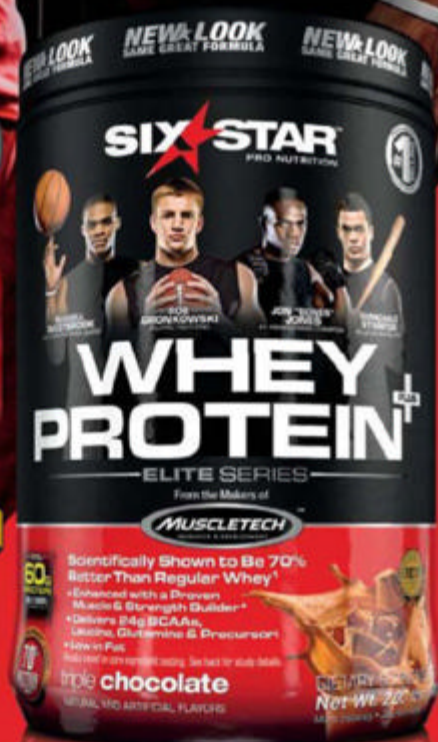
Select

**CVS/pharmacy**

**Walgreens**



**meijer**

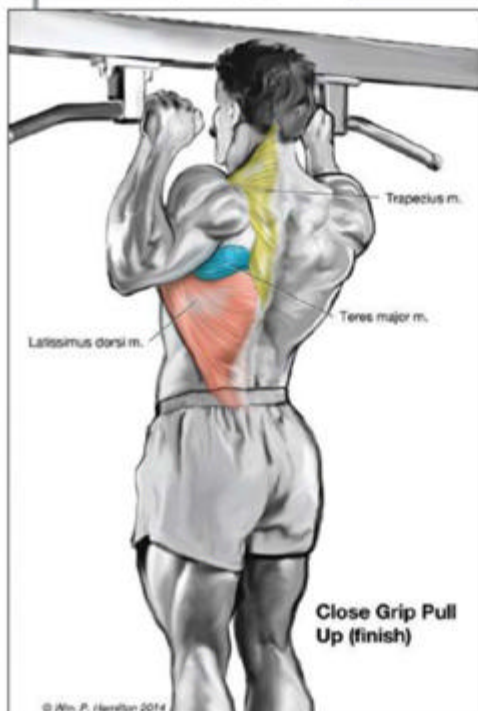
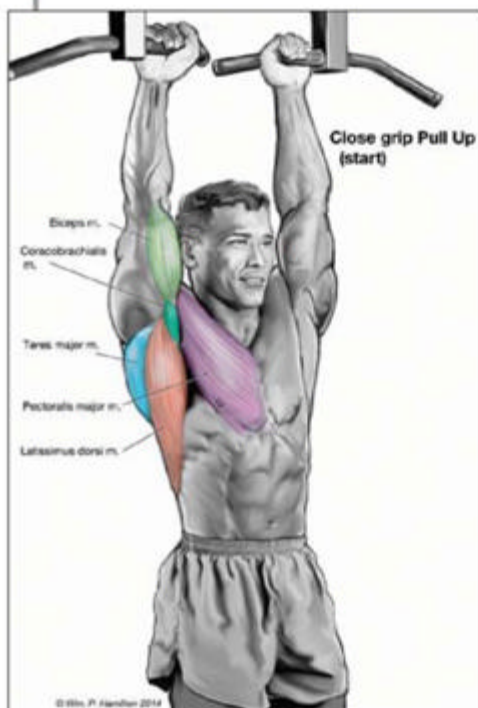


PREMIUM SUPPLEMENTS. SMART PRICE.



# CLOSE-GRIP PULL-UPS

## OLD-SCHOOL TRAINING FOR NEW-WORLD RESULTS



Close-grip pull-ups (or chins) were probably forced on you in gym class, perhaps by an overweight PE teacher (who had not done pull-ups in many years). If this was the case, you may not have developed much affection for this exercise. However, it turns out that this old-school exercise is really a very good tool for blitzing most of the muscles of the middle and upper back, shoulders, chest and arms.<sup>1,2</sup> It also turns out that close-grip chins are great to use if you are traveling and not near a gym, and also as an addition to your back- or arm-training day.

### MUSCLE STRUCTURE AND FUNCTION

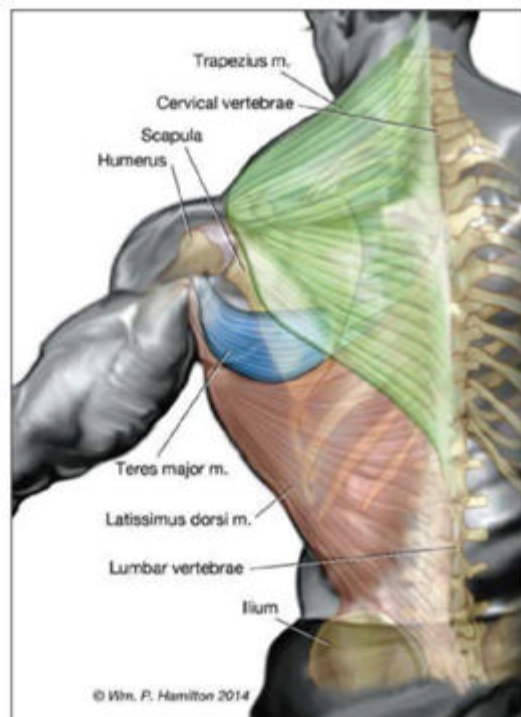
Many muscles are recruited to accomplish close-grip pull-ups, which makes it a difficult but extremely productive exercise. This includes everything from the intrinsic muscles of the hand to grip the bar, to the forearm and especially the upper arm muscles that help in the pull upwards, and the deltoid and upper back muscles to continue the pull-up.

The latissimus dorsi muscle is a major upper back muscle that is activated by close-grip pull-ups.<sup>3</sup> This muscle connects the vertebrae in the thorax and lumbar regions and the iliac crest of the hipbone, to the humerus bone of the upper arm near the shoulder.<sup>3</sup> The muscle fibers of the latissimus dorsi muscle adduct the humerus (bring the arm towards the center of the body), and extend the humerus (pulls the arm backwards) to pull the body upwards towards the bar. The close-grip pull-up keeps the humerus in an adducted position. The upper fibers of the latissimus dorsi muscle are most completely activated when the hands begin above shoulder height and they are pulled towards the armpits (axilla), during the pull-up exercise.

The teres major muscle begins on the inferior angle of the scapula (shoulder blade), and it attaches to the humerus bone of the upper arm. It assists in arm extension, and adduction of the arm at the shoulder joint when the arms are over the head in close-grip pull-ups.<sup>3</sup> The short head of the biceps brachii muscle begins on the front part of the scapula bone.<sup>4</sup> The long head of the biceps brachii muscle attaches on the scapula near the shoulder joint. The long head sits on the lateral part of the arm, and its fibers mesh with the short head on the medial side of the

arm to insert into the bicipital tendon, which attaches to the radius bone of the forearm. Both heads of the biceps flex the elbow joint.<sup>4</sup> The brachialis muscle is also a major elbow flexor.<sup>4</sup> It begins on the distal half of the humerus and it inserts on the ulna bone of the forearm. Even the pectoralis major muscle of the chest is activated in close-grip pull-ups.<sup>1</sup> The sternocostal head of the pectoralis runs from the manubrium (the top portion of the sternum or "breast bone"), and the upper six ribs and converges near the head of the humerus.<sup>4</sup> The pectoralis major muscle adducts the humerus in the close-grip position. It is most active at the beginning of the pull-up, and it has less of a role as the chest is pulled close to the bar.

The upper fibers of the large trapezius of the upper back attach along the posterior base of the skull and the cervical vertebrae of the neck. These fibers attach to the lateral part of the clavicle (collar bone) and along the spine of the scapula. They pull the clavicle upwards in the pull-up. The middle fibers of this muscle begin on the upper thoracic vertebrae, then run to the spine of the scapula. They pull the scapula towards the vertebrae at the top of the pull-up.<sup>5</sup>





# HARD TO THE CORE

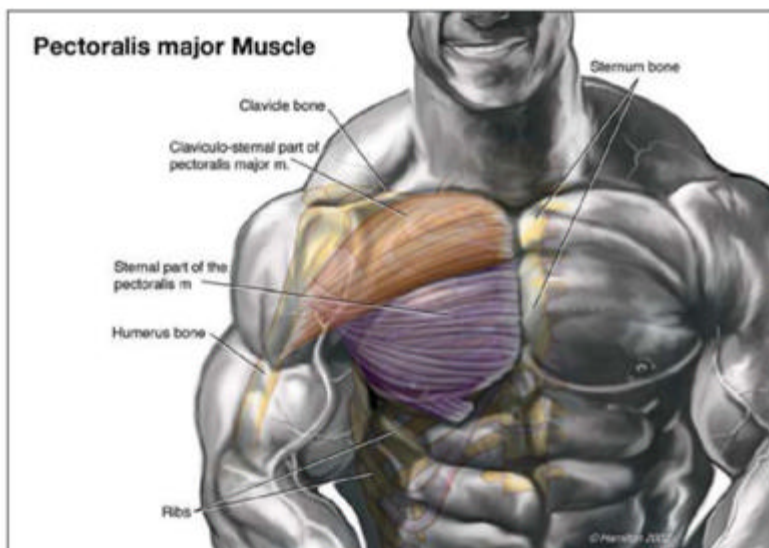


**NEW!**

## POWERFUL WEIGHT LOSS. AWESOME SENSORY.

Want hardcore results from your thermogenic? Then get XENADRINE CORE™, which contains caffeine anhydrous for extreme energy. New XENADRINE CORE™ also includes the dynamic and novel ingredients **gotu kola**, **perilla leaf extract** and **caraway seed extract**. Plus, this formula has green coffee extract to promote hardcore weight loss. In fact, the average weight loss with green coffee was 10.95 lbs. in a 60-day study with a low-calorie diet, and 3.7 lbs. in an 8-week study with a calorie-reduced diet and moderate exercise. Get it today!





### CLOSE-GRIP PULL-UPS

If you cannot do bodyweight pull-ups, use an assisted pull-up machine, as this will allow you to get the benefit from the exercise without requiring you to initially have the strength to pull up your entire bodyweight. After a couple of weeks, you will be able to reduce the amount of weight on the assisted machine, and in a few months you will be ready to tackle the exercise without any additional resistance on the assistant machine.

1. Follow the instructions for your assisted machine pull-ups for set up (kneel or stand on the platform as appropriate) and select desired weight. If you are not using the assist machine, step up on a box that will allow you to grab a pull-up bar.

2. Take a narrow grip\* (shoulder width or slightly narrower) on the bar overhead, just above your head. The hands should be pronated (palms facing away from your face).

3. Pull yourself up (flex the elbows and extend the arms) until the bar is adjacent to the upper part of the chest (just above the chin). Attempt to get your body as high as possible to ensure a complete contraction of the upper and intermediate back muscles (i.e., trapezius, and small scapular muscles) and the elbow flexors (biceps and brachialis).

4. Slowly (3-5 seconds) lower yourself until your arms, upper back and chest are completely stretched at the bottom position. Start upwards and repeat the sequence to finish the set.

The pull upward extends the humerus bone and activates the latissimus dorsi, teres major, part of the pectoralis, trapezius and deltoid muscles.<sup>1,2</sup> The elbows, however, must flex so the biceps brachii and brachialis muscles are strongly activated.<sup>3,4</sup>

Do not fret if at first, you find it difficult to do the pull-ups without some assistance. With some consistent effort and time invested into the training program, you will be able to reduce the assistance and pull your body up multiple times and without any help. The hanging position on the close-grip pull-up causes a traction gravitational load on the spine<sup>5</sup> that safely carves out a strong, hard-as-granite look to your upper body. Not a bad result for such a basic old-school exercise. ■

#### References:

1. Youdas JW, Amundson CL, Cicero KS et al: Surface electromyographic activation patterns and elbow joint motion during a pull-up, chin-up, or perfect-pullup rotational exercise. *J Strength Cond Res* 2010;24:3404-3414.
2. McGill SM, Cannon J, Andersen JT: Muscle activity and spine load during pulling exercises: influence of stable and labile contact surfaces and technique coaching. *J Electromyogr Kinesiol* 2014;24:652-665.
3. Tucker WS, Bruenger AJ, Doster CM et al: Scapular muscle activity in overhead and nonoverhead athletes during closed chain exercises. *Clin J Sport Med* 2011;21:405-410.
4. Moore, K.L. Clinically oriented Anatomy. Third edition. Baltimore, Williams & Williams, 501-553, 1992.
5. Signorile JF, Zink AJ and Szwed SP. A comparative electromyographical investigation of muscle utilization patterns using various hand positions during the lat pull-down. *J Strength Cond Res* 16: 539-546, 2002.

Run • Bike • Swim • Run • Bike • Swim • Run • Bike • Swim • Run • Bike • Swim • Swim • Run • Bike

# GOT TESTOSTERONE?

Now with Lypoject syringes!

No needles

No pain

No Doctor needed



[www.generictestosterone.com](http://www.generictestosterone.com)

Run • Bike • Swim • Run • Bike • Swim • Run • Bike • Swim • Run • Bike • Swim • Swim • Run • Bike

Strength • Speed • Endurance • Recuperation • Strength • Speed

Strength • Speed • Endurance • Recuperation • Strength • Speed



**B**

# UNLEASH — THE — BEAST™



## CREATINE SUPPLEMENT — OF THE YEAR —

Creature® creatine complex delivers five advanced forms of creatine to fuel muscle growth, increase strength and keep you training LIKE A BEAST.\*

# BEAST™

THE STRONGEST NAME IN SPORTS NUTRITION™

AVAILABLE AT



**V** theVitamin Shoppe



VITAMIN WORLD

**GNC**  
LIVE WELL

**BEASTSPORTS.com**

\* THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION. THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.  
© 1995 - 2015 Beast Sports Nutrition. All Rights Reserved



# MASTERS ATHLETES

The popular image of CrossFit is of seemingly invincible 20-somethings hoisting barbells, climbing ropes or flipping tractor tires. But CrossFit is midway into its second decade, which means a generation of high-intensity athletes is aging into their 40s and older. These aging bad asses, aka “masters athletes,” carry with them a lifetime of accumulated injuries, and the tissue stiffness that builds up with age. Yet, they’re training and competing alongside much younger athletes, often outperforming young pups with less CrossFit experience.

“I’m much stronger with better positions at 41 than when I was 21, when I was paddling on a national team,” said Kelly Starrett, an elite kayaker who’s become CrossFit’s mobility guru. “But the tolerances for silly BS become smaller: unstable hip position, internally rotated shoulders. You can’t get away with inefficient movements as readily as you can when you’re 21. In the masters athletes, we see greater professionalism. They really warm up. They have a dedicated mobility practice—they have to, or they can’t physically perform the positions. There’s more attention to sleep quality and nutrition quality. If I had warmed up and had better positions in high school, I’d have done better. I just didn’t feel it.”

At San Francisco CrossFit, where Starrett coaches, masters athletes arrive 15 minutes early to get a jump on their warm-ups. “I need them to be hot and sweaty,” he said, “before they start training.” Younger athletes who blow off mobility work, hit the workout cold and eat garbage can recover overnight. Middle-aged athletes, not so much.

On the other hand, masters ath-

letes who’ve been doing CrossFit for years have done tens of thousands of lifts, incrementally improving technique with each WOD. “There’s a saying in jiu-jitsu: technique triumphs over all,” says Greg Amundson, CrossFit’s “original firebreather” who smoked all-comers in his early 20s and continues to set personal records in his 40s.

“It’s no different than a black belt—they have mastered technique. What we can learn from our masters level athletes is precision in training. We can learn that there’s immense value in the balance of work to rest. The volume that a 20-year-old can handle is simply not feasible for someone in their 50s or 60s. But they have mastery of range of motion, doing exactly what is required, no more no less, line of action and movement, the successful application of force, knowing when to apply force and when to rest. As you go into your 40s, 50s and 60s, there’s a shift from the recklessness of youth to the pursuit of virtuosity and mastery.”

Ultimately, the ability to put one’s ego in check, a hallmark of life experience, is the master’s athlete’s secret sauce. “Develop patience and keep your ego in check. Bury them on the stuff you are really good at and concede the rest,” said John Mariotti, who owns CrossFit Odyssey in Dallas. In last year’s CrossFit Games, he finished sixth among athletes 55-59, and in 2014 he was the Texas state weightlifting champion in his age and weight division. “The closer you work to the edge, the more likely you will get in too deep.” A moment later, he apologizes for the typos in his response. “I broke my hand doing handstand walks the other day. Over the edge!” ■

## BIOGRAPHY

J.C. Herz (@jcherz) is the author of *Learning to Breathe Fire: The Rise of CrossFit and the Primal Future of Fitness* (Crown Books), a book about the science and the psychology of physical intensity, and the link between CrossFit’s ritual intensity and the genesis of sport in ancient human society. *Learning to Breathe Fire* is a proud supporter of TeamRWB.org, a nonprofit dedicated to improving the lives of returning veterans through fitness. JC has also assembled a spirited tribe of CrossFit firebreathers on *Learning to Breathe Fire*’s Facebook page.



# THE PROOF IS IN THE PUDDING!

## POWER PAK PUDDING

Finally – a great tasting muscle building snack that delivers 30 grams of the highest quality protein without the loads of calories, carbs, fats, sugar and sugar alcohols found in most protein bars! Now, you can get a delicious, high protein treat without compromising on quality nutrition with MHP's ready-to-eat Power Pak Pudding!

- **30g PROTEIN**
- **SUGAR FREE**
- **LOW CARB**
- **LACTOSE FREE**
- **ONLY 190 CALORIES**



**Taste Test Video!**  
See what consumers are  
saying about  
Power Pak Pudding!

Available in Dutch Chocolate & Vanilla Creme

Available at:

**GNC**  
LIVE WELL

**theVitamin  
Shoppe**



**Lucky Vitamin**  
The Vitamin Store of the Future

**POPEYE'S**  
NATURAL SUPPLEMENTS



Join Team MHP!

facebook.com/TeamMHP  
twitter: @MHPStrong  
instagram: mhpstrong

Call Now or Go Online to Order

1.888.783.8844

**MHPSTRONG.com**

**MHP**  
MAXIMUM HUMAN PERFORMANCE





# FIND YOUR DRIVING FORCE

day to do. It never changes and that's simply what it is.

Now, everybody is different, but that is my driving force. The key is that you have to find yours. What's inside of you and what do you want to do? When you're trying to figure this out, make sure it is true to *you*. It doesn't matter if anybody else thinks it is right or not. If it fits for you, then go with it. It's solely up to you, your situation and your motivating factors.

I come from a straight blue-collar household that undoubtedly taught me the definition of real work. However, working underground as a coal miner for 25 years wasn't for me. Without question, that wasn't my driving force. I needed to find something different and something true to me. I needed to find a way to ignite that fire inside of me, one that will never relent and never burn out. It had to be something to drive me no matter how long it takes to reach this purpose and goal.

That's a key factor in finding your own driving force. Is it something that's truly going to push you day in and day out? If you know it is, then you've found it.

So the next step is figuring out what you want to do after you've found that driving force. Using that passion and carrying it over into your life is extremely important. For me, it was a matter of how do I execute my plan in creating generation change in my family? These are questions you need to ask yourself once you figure out your driving force. You need to break it down to daily, monthly and yearly goals, figuring out your plan of attack. Then you have to be consistent, day after day, month after month and year after year to ensure you reach that ultimate goal.

Clearly, that's where a lot of people struggle. The "what's next?" part of the process is the biggest part of the journey. You have to lay out a plan and then go execute it with a locked-in mindset day after day. The person who has a true vision combined with an unrelenting work ethic will make his or her own luck. That always seems to be the case. There are no shortcuts to success, that is for sure. Waiting to hit that winning lottery ticket is a recipe for disaster. Anything worth achieving takes vision, work, execution of the plan and also dealing with naysayers and obstacles.

There will be plenty of difficult points, but if it's your driving force, nothing will stop you from reaching your goal. The achievement when I get to mine will ensure that the journey will be worth it.

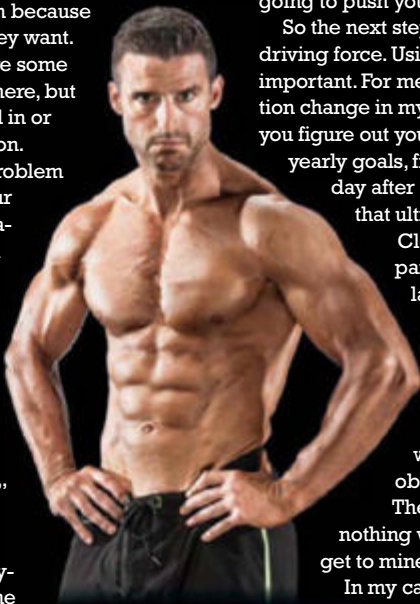
In my case, it should affect a few different generations. ■

**W**hen it comes down to it, do you know what you want? I mean really, deep down know what you want? I think a lot of people have problems with motivation because they really don't know what they want. They may think they do or have some fleeting motivation here and there, but they are either not fully locked in or not fully sold on their motivation.

This can easily become a problem when it relates to reaching your goal. With a lack of true motivation, you get up every day and just aimlessly roll through life. You go to your nine-to-five job, lack motivation and before you know you're force-feeding quarters into the vending machine. Nothing is planned, nothing is driving you and all of a sudden you're feeling like, "What is it all for?"

To help combat this, I set aside a statement that clearly indicated what I wanted for myself. Mine was simple and to the point, but it's been very effective. It was: "I want to change generations of wealth of Gregorys in my family, and I want to do it in such a way that my grandkids will benefit from what I'm doing and accomplishing now." In addition to that, I wanted to be the most impactful person in my industry. With that, I had my motivation and driving factor.

Those reasons are what I get up every



## BIOGRAPHY

Cory Gregory co-founded MusclePharm with Brad Pyatt in 2008 and serves as Executive Vice President. A former underground coal miner, Gregory worked diligently to save money to realize his dream of opening his own gym by the age of 20. In the last 15 years, he has gained extensive experience and has received a number of accolades within several aspects of the fitness industry. Obtaining an Exercise Specialist certificate from Columbus State, Gregory is also NESTA nutrition coach certified and Westside Barbell certified. In addition to his in-depth knowledge of bodybuilding and nutrition, he is a CrossFit Level-1 trainer further helping MusclePharm's athletes and ambassadors achieve their fitness goals. Gregory prides himself on embodying the MusclePharm culture, as he has been featured on the cover of top fitness magazines, including FitnessRx. Weighing just 208 pounds, he has achieved a powerlifting total of 1,755 pounds, culminating in a career-best 700-pound squat. Most recently, Gregory was added to the Arnold Schwarzenegger Fitness Advisory Board.





# HARDCORE

IS A MINDSET



ENERGY\*



PUMP\*



FOCUS\*

**NO** PROPRIETARY  
BLENDS

**6G** CITRULLINE  
MALATE

**4G** L-LEUCINE

**3G** D-ASPARTIC  
ACID

NEW:



**MP**  
MUSCLEPHARM.

EXCLUSIVELY AT:



BODYBUILDING.COM





# THERMO HEAT MULTI

## ADVANCED METABOLIC FUNCTION AND HEALTH

**H**uman health is enhanced by a diet that includes adequate intake of essential vitamins and minerals. These essential vitamins and minerals function as micronutrients that sustain a wide array of biochemical and physiological processes in the body, making them necessary for normal bodily function and good health.

Because the body cannot produce these indispensable vitamins and minerals, they must be obtained from the diet. Unfortunately, the modern diet is typically dense in calories but nutrient deficient, meaning most people today do not consume even the minimal daily requirement for many of these essential vitamins and minerals, causing a nutritional deficiency that increases the risk for several diseases.<sup>1</sup>

The preponderance of certain life-threatening diseases such as diabetes, cardiovascular disease and cancer has increased significantly within the past century.<sup>2</sup> While many rationalize the current outbreak of chronic disease by declaring that longer life spans and better medical diagnostics are the exclusive reasons for the apparent increase in certain chronic disease, there is emerging evidence that suggests the increased prevalence of many of these chronic diseases is associated with a diet lacking the appropriate antioxidants that protect the body against chemically reactive species, known as free radicals, that damage vital biomolecules, causing them to malfunction, thus promoting the disease state. Furthermore, and perhaps most importantly, the modern diet is loaded with chemicals that trigger the production of free radicals, causing even more oxidative damage in the body. The accumulation of oxidative damage triggers an immune response causing inflammation. In addition, the high-caloric value of the contemporary diet increases the storage of fat within the fat cell. When the fat cell gets larger, it becomes more biochemically active, cranking out pro-inflammatory cytokines, such as TNF-alpha, which also activates the immune system, further increasing the overall inflammatory response in the body.<sup>3</sup>



Altogether, the collective inflammatory response from oxidative damage and pro-inflammatory cytokines secreted from fat cells leads to an extensive period of inflammation or chronic inflammation. In contrast to acute inflammation, which is a normal process that protects and heals the body following physical injury or infection, chronic inflammation is abnormal and does not benefit the body. In fact, chronic inflammation is involved in a number of disease states. For instance, chronic inflammation in fat cells is closely related to the development of insulin resistance and type 2 diabetes.<sup>4</sup> Similarly, activated immune cells and chronic inflammation can damage the coronary arteries, promoting cardiovascular

disease<sup>5</sup> or stimulate the initiation of cancerous tumors.<sup>6</sup>

The multivitamin and mineral supplement was intended to fill the significant nutritional void in today's diet, promoting better health. However, because of the severity of nutritional issues with the modern diet, most multivitamins and mineral products fall severely short of this goal. Moreover, recent scientific evidence indicates that many multivitamin and mineral products on the market today may actually impede overall health by supplying an excessive amount of certain chemicals that increase oxidative stress and chronic inflammation contributing to the onset of the aforementioned chronic diseases.

In addition to their inability to improve health, multivitamin and mineral products available today are typically unable to function as a performance enhancer. That is, until now, as the most revolutionary supplement company on the planet, Advanced Molecular Labs, has meticulously formulated a revolutionary new product, Thermo Heat Multi, that extinguishes destructive oxidative stress and chronic inflammation, promoting superior health while simultaneously enhancing exercise performance and reducing body fat like no other multivitamin and mineral product ever has before.

### IMPROVES OVERALL METABOLIC HEALTH

Thermo Heat Multi contains a blend of vitamins that have demonstrably been shown to enhance health and wellness. Included in this blend is the fat-soluble vitamin A that helps maintain healthy skin, teeth and soft tissue while also being important for efficient immune system function and good vision.<sup>7</sup> Vitamin A also has potent anti-inflammatory properties, suppressing the expression of pro-inflammatory agents such as IL-6 and increasing the secretion of anti-inflammatory cytokines.<sup>8</sup> Thermo Heat Multi has antioxidant support in vitamin C and vitamin E, which chemically neutralize free radicals and other oxidizing agents.<sup>9,10</sup>



## BOOSTS THYROID FUNCTION, REDUCES OXIDATIVE STRESS AND REDUCES BODY FAT

Thermo Heat Multi only contains essential minerals that improve health by alleviating oxidative stress while burning body fat, which removes chronic inflammation, leading to a more vigorous metabolism and superior overall health. One way Thermo Heat Multi accomplishes this effect is by enhancing thyroid gland function. The thyroid gland's primary purpose is to control metabolic rate by way of several hormones, including the most important triiodothyronine or T3.

A sluggish thyroid that does not produce enough T3 decreases metabolic rate, leading to fatigue and weight gain. Thermo Heat Multi contains two important minerals, selenium and iodine, which improve thyroid function, increasing energy levels and metabolic rate. Selenium improves thyroid activity by functioning as a cofactor for the enzyme deiodinase, which catalyzes the production of T3, making selenium absolutely required for T3 production and optimal thyroid performance.<sup>11</sup> In addition, greater T3 levels from selenium intake also kindle thermogenesis for enhanced elimination of body fat.<sup>12</sup> Selenium also functions as a cofactor for

tains several unique compounds that accomplish both with the most prominent being vitamin D, or more precisely vitamin D3, which is the more active form of vitamin D in the body.<sup>13</sup>

Vitamin D is unique because it promotes overall health like other vitamins while also improving muscle growth and exercise performance. Some of the health benefits associated with vitamin D include greater absorption and metabolism of calcium and phosphorous for improved bone health. In addition, low levels of vitamin D correlate with several diseases such as cancer,<sup>17</sup> cardiovascular disease<sup>18</sup> and obesity,<sup>19,20</sup> indicating the requirement of vitamin D intake to prevent these disorders.

Some of the muscle-building properties associated with vitamin D evidently come from its capacity to directly bind and activate the androgen receptor in a similar fashion to testosterone, which consequently turns on several anabolic genes that drive muscle growth. Vitamin D further improves the physique by triggering fatty acid oxidation,<sup>21</sup> which causes greater fat loss.<sup>19</sup>

Thermo Heat Multi contains 4,000 IU of vitamin D (from vitamin D3), the amount reported in the research to be beneficial for enhanced muscle growth and fat loss.

of these compounds to the TRPV receptor stimulates the release of noradrenaline, which activates the thermogenic process in BAT.

Thermo Heat Multi contains compounds, known as capsaicinoids, which bind the TRPV receptor and potentially induce thermogenesis. In fact, studies have shown that capsaicinoids not only trigger BAT-driven thermogenesis and fat loss but also increase the levels of BAT facilitating greater levels of thermogenic energy expenditure and fat loss.<sup>22,23</sup> Capsaicinoids have also been shown to reduce food intake,<sup>24,25</sup> giving them the capability to increase energy expenditure and fat oxidation while reducing energy intake, providing a surefire way to lose body fat and keep it off.

## EXCLUSIVE SPICE BLEND ALSO SUPPRESSES APPETITE AND THERMOGENICALLY INCINERATES FAT

Thermo Heat Multi also contains a unique blend of spices that burn fat and suppress appetite including bioperine, cinnamaldehyde and gingerol. Bioperine and gingerol have been reported to activate the TRPV1 receptor while cinnamaldehyde activates another member within the TRPV1-family of receptors, the TRPA1 receptor. Activation of this family of receptors by these spices triggers thermogenic-energy expenditure in a similar fashion to capsaicinoids,<sup>26,27</sup> which ultimately depletes body fat. All three compounds have also been shown to decrease appetite, giving them even greater capacity to bolster fat loss by increasing energy expenditure while also decreasing energy intake.<sup>28,29,30</sup> An additional advantage of bioperine intake is its remarkable capacity to enhance the bioavailability, and thus activity, of many different compounds. Consequently, inclusion of bioperine in Thermo Heat Multi plausibly enhances the potency of several compounds in Thermo Heat Multi, making this already potent supplement even more powerful.

## THERMO HEAT MULTI POLYPHENOLS FURTHER SUPPORT THERMOGENICALLY DRIVEN FAT LOSS

A wide variety of polyphenolic compounds in Thermo Heat Multi support weight loss and better health by stimulating thermogenic and non-thermogenic fatty acid oxidation while also suppressing oxidative stress and inflammation, such as grape seed and red wine polyphenols. The remarkable polyphenol resveratrol has received widespread attention as a possible anti-aging compound. Many of these anti-aging effects conceivably come from the potent antioxidant<sup>31</sup> and anti-inflammatory properties<sup>32</sup> of resveratrol. Resveratrol also triggers fat loss by directly activating two key energy-sensing enzymes SIRT1 and AMPK that turn on both thermogenic<sup>33</sup> and non-thermogenic fatty acid oxidation,<sup>34</sup> bringing about fat loss.

Thermo Heat Multi has several other poly-

**THERMO HEAT MULTI EXTINGUISHES DESTRUCTIVE OXIDATIVE STRESS AND CHRONIC INFLAMMATION, PROMOTING SUPERIOR HEALTH WHILE SIMULTANEOUSLY ENHANCING EXERCISE PERFORMANCE AND REDUCING BODY FAT LIKE NO OTHER MULTIVITAMIN AND MINERAL PRODUCT EVER HAS BEFORE.**

several proteins that protect against oxidative damage, giving selenium antioxidant properties that reduce the likelihood for certain diseases like cancer. In fact, higher selenium levels in the body have been shown to lower the risk for colorectal cancer.<sup>13</sup>

Thermo Heat Multi further supports normal thyroid function by providing the mineral iodine, which is also required by the thyroid for T3 production as iodine deficiency has been shown to reduce thyroid function and decrease metabolic rate.<sup>14</sup> What's more, a combined deficiency in selenium and iodine appears to be even more detrimental to thyroid function, as a study by Beckett et al.<sup>15</sup> showed that rats deficient in selenium and iodine had much lower T3 levels than in rats deficient in iodine alone, further highlighting the importance of these two minerals for optimal metabolic function and wellness.

## THERMO HEAT MULTI CONTAINS THE OPTIMAL DOSAGE OF VITAMIN D3 FOR ENHANCED MUSCLE GROWTH AND FAT LOSS

While most multivitamin and mineral combinations do not enhance performance in the gym or improve the physique, Thermo Heat Multi con-

## A NOVEL THERMOGENIC BLEND THAT SUPPORTS A LEANER BODY AND MORE ROBUST METABOLISM

Body fat accumulates when energy intake exceeds energy expenditure. The ideal way to increase energy expenditure and fat loss is exercise. However, a multivitamin and mineral supplement that also increases energy expenditure should foster even greater fat loss, especially when added to a good exercise routine. Thermo Heat Multi, with its unique blend of compounds that increase energy expenditure by a process known as thermogenesis, is that supplement!

Thermogenesis occurs when the production of cellular energy (in the form of ATP) is uncoupled with fat burning. As a result, instead of the energy from fat being used to synthesize ATP, it is instead converted into heat, which effectively increases energy expenditure. Brown adipose tissue (BAT) has been shown to be the most thermogenic tissue in the body because it is loaded with the protein UCP-1 that directly uncouples fat oxidation with ATP production driving thermogenesis. BAT-thermogenesis can be triggered by compounds that bind to a class of receptors, known as TRPV receptors, within the oral cavity or gastrointestinal tract. The binding



phenols that independently contribute to its fat-reducing capacity. The polyphenolic oleuropein is one of these polyphenols that directly triggers the secretion of noradrenaline which, as previously mentioned, increases BAT-driven thermogenesis.<sup>35</sup> Another polyphenolic with potent thermogenic properties is the compound kaempferol. In contrast to the previously mentioned compounds, kaempferol uniquely activates thermogenesis in muscle cells without triggering noradrenaline release or TRPV receptor activation. Instead, kaempferol stimulates thermogenesis by triggering thyroid hormone production,<sup>36</sup> which activates a different thermogenic-signaling pathway specifically in muscle.

Curcumin is a naturally occurring polyphenolic compound derived from the turmeric plant. It is commonly used in many parts of the world as a spice and medical agent to treat a wide variety of ailments.<sup>37</sup> Research has identified curcumin as the active compound responsible for most of the health benefits associated with turmeric consumption,<sup>38</sup> which include anti-inflammatory, anti-cancer and antioxidant effects.<sup>39,40</sup> Interestingly, curcumin also activates thermogenesis by functioning as an energy-uncoupler itself, which alleviates the requirement for UCP-1. In addition to the many targets that curcumin regulates to improve overall health and fat loss, curcumin also increases production of the muscle-building hormone testosterone, resulting in a more anabolic environment that boosts the hypertrophic response in muscle tissue.

The polyphenolic compounds in Thermo Heat Multi provides considerable antioxidant protection while concurrently assisting improved fat loss, which together reduces local and systemic inflammation for improved metabolic function and well-being.

### MORE BAT FOR GREATER FAT LOSS

In addition to boosting thermogenic-activity in BAT, increasing the amount of BAT in the body would potentially increase the overall thermogenic response for a more robust capacity to shed body fat. A compound naturally found in many fruits and herbs and also found in Thermo Heat Multi, known as ursolic acid,<sup>41</sup> has been shown to increase both BAT quantity and thermogenic-activity.<sup>42</sup>

### BERBERINE CONVERTS ADIPOSE TISSUE FROM FAT DEPOT INTO A FAT INCINERATOR

There are two distinct types of BAT, one being the classical BAT that derives from a muscle-like cell lineage that is typically found in rather small amounts throughout the neck and scapular regions of the body. In addition, brown fat-like cells can also emerge from the better known, and much more abundant, white adipose tissue after

exposure to various stimuli such as cold temperatures in a process called “browning.” These newly formed brown fat-like cells can also thermogenically burn fat. Because of their greater abundance, they represent a better way to increase the overall amount of thermogenic-induced fat loss.

Recent research has discovered that the compound berberine causes the “browning” of white adipose tissue by inducing the expression of many genes associated with thermogenic function in BAT. Interestingly, this study also demonstrated that berberine-induced browning of white adipose tissue is triggered by the activation of AMPK in fat cells without activating AMPK in the hypothalamus, which would trigger hunger and likely negate any additional calories burned via thermogenesis in BAT.<sup>43</sup> Berberine has also been shown to increase energy expenditure, limit weight gain and enhance brown adipose tissue (BAT) activity in obese mice.<sup>44</sup>

**THE POLYPHENOLIC COMPOUNDS IN THERMO HEAT MULTI PROVIDES CONSIDERABLE ANTIOXIDANT PROTECTION WHILE CONCURRENTLY ASSISTING IMPROVED FAT LOSS, WHICH TOGETHER REDUCES LOCAL AND SYSTEMIC INFLAMMATION FOR IMPROVED METABOLIC FUNCTION AND WELL-BEING.**

### TOO MUCH IRON, COPPER AND MANGANESE BOOSTS OXIDATIVE DAMAGE, INFLAMMATION AND CHRONIC DISEASE

Iron is an essential trace element typically found in enzymes and proteins that participate in numerous biological processes such as enzymatic reactions and the transport of oxygen throughout the body. Iron deficiency is one of the most common deficiencies in the USA, according to the CDC, creating a large demand for iron-containing supplements. However, the use of iron-containing supplements doesn't seem to be such a good idea as the daily requirement for iron ranges from 8 milligrams for men to 18 milligrams for premenopausal women, which is normally the amount of iron found in most multivitamin and mineral products. So, you may be asking, why shouldn't you take these iron-containing supplements, especially if they're providing the daily requirement? Because you're

also getting generous amounts of iron from your diet, as many common foods are heavily fortified with iron such as cereals, bread and pasta. So supplementing a diet with iron-fortified foods will conceivably lead to the consumption of too much iron, which may not sound so terrifying. That is, until you realize that several recent studies have shown that too much iron in the diet can increase oxidative stress and boost inflammation,<sup>45</sup> which, as previously mentioned, is a hallmark for many life-threatening diseases.

Iron is found in the body in two forms: one form is bound to the prosthetic heme group, while the other is in a free form unbound to heme. The free form of iron can be harmful because it reacts with other compounds in the body, producing free radicals causing irreparable oxidative damage to key components of the cell, including proteins, lipids and DNA. Consequently, when inside the cell, the free form of iron is stored inside a protein called ferritin, which prevents the unwanted release of iron to avoid oxidative damage. In fact, studies have shown that increased dietary iron intake increases cellular levels of ferritin to provide greater storage capacity for the additionally ingested iron. Yet, unexpectedly, greater ferritin levels induced by iron intake actually triggers inflammation<sup>45</sup> increasing the risk for obesity<sup>46</sup> and diabetes.<sup>45,47</sup> This is likely because higher ferritin levels function as a signal to the body that a lot of iron is around. The body responds to this signal by activating the immune system, which can prevent the release of iron from the primary iron-storage site, the liver. So, essentially, the body is doing its best to lower serum iron levels despite the fact that it could cause chronic inflammation and disease. In addition, this unexpected inflammation from too much iron intake may also be due to iron intake exceeding the storage capacity of ferritin, resulting in the release of free iron into the cell, causing additional oxidative damage and inflammation.

Comparable to iron, the element copper also generates oxidative damage, particularly in neurons, making too much copper intake in the diet unhealthy, as evidence shows that ingestion of copper from supplement pills, along with a high fat diet, contributes to the onset of Alzheimer's disease.<sup>48</sup> More specifically, it was shown that serum copper levels were elevated in patients with Alzheimer's disease and this higher copper level correlated with loss of cognition. In addition, copper accumulation in certain tissues has also been associated with certain pathologies including cancer, as copper can contribute to the growth of certain cancers while improving cancer metastasis in other forms.<sup>49,50</sup>

Excessive consumption of the element manganese has also been identified as a health risk, as accumulation of manganese in the central nervous system promotes neurotoxicity, result-



ing in the neurological brain disorder manganism. In addition, elevated serum levels of manganese have been found in different neurodegenerative diseases, including Parkinson's disease<sup>51,52,53</sup>, where manganese has been shown to promote the production of the abnormal protein aggregates called Lewy bodies that apparently contribute to Parkinson's disease.

Manganese's deleterious influence on health is likely due, in part, from oxidative damage within the body, as manganese can generate free radicals in a similar fashion to iron and copper. Manganese also tends to accumulate in specific cells in the brain called the astrocytes, causing them to malfunction. Since the astrocyte normally provides essential nutrients to neurons, malfunction of

the astrocyte prevents the required nutrition for the neuron, thus depleting neuronal function and promoting neurodegeneration.<sup>54</sup> Because of the inherent medical risks associated with superfluous iron, copper and manganese intake, Thermo Heat Multi does not contain any form of these elements.

## TOO MUCH CALCIUM INCREASES CARDIOVASCULAR DISEASE RISK

Calcium intake has been promoted for quite some time because of its apparent ability to improve bone health. Calcium is also required for many other essential bodily functions, including nerve function, muscular contraction and the regulation of certain hormones.<sup>50,55</sup> As a result, most

multivitamins contain a considerable amount of the daily recommended allowance for calcium.

However, a few recent studies indicate that calcium supplementation may not be as beneficial to bone health as once thought and may actually be detrimental to cardiovascular health. The first report states that while calcium may slow bone loss to some degree, there is no significant reduction in fracture prevention.<sup>51,56</sup> In a second report by the National Institutes of Health, it was shown that calcium supplements, not dietary calcium, increased the risk of death from cardiovascular disease.<sup>52,57</sup> Because of the apparent adverse effects associated with calcium supplementation along with an inability to enhance bone health, Thermo Heat Multi does not contain any form of calcium. ■

## REFERENCES

1. Fulgoni VL, 3rd, Keast DR, et al. Foods, fortificants, and supplements: Where do Americans get their nutrients? *J Nutr* 2011;141, 1847-1854.
2. Remington SM, and Brownson RC. Fifty years of progress in chronic disease epidemiology and control. *MMWR Surveill Summ* 2011;60 Suppl 4, 70-77.
3. Coppel SW. Pro-inflammatory cytokines and adipose tissue. *Proc Nutr Soc* 2001;60, 349-356.
4. Hotamisligil GS. Inflammation and metabolic disorders. *Nature* 2006;444, 860-867.
5. Haffner SM. The metabolic syndrome: inflammation, diabetes mellitus, and cardiovascular disease. *Am J Cardiol* 2006;97, 3A-11A.
6. Lin WW and Karin M. A cytokine-mediated link between innate immunity, inflammation, and cancer. *J Clin Invest* 2007;117, 1175-1183.
7. Trumbo P, Yates AA, et al. Dietary reference intakes: vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. *J Am Diet Assoc* 2001;101, 294-301.
8. Luo XM and Ross AC. Physiological and receptor-selective retinoids modulate interferon gamma signaling by increasing the expression, nuclear localization, and functional activity of interferon regulatory factor-1. *J Biol Chem* 2005;280, 36228-36236.
9. Birlouez-Aragón I and Tessier FJ. Antioxidant vitamins and degenerative pathologies. A review of vitamin C. *J Nutr Health Aging* 2003;7, 103-109.
10. Ricciarelli R, Zingg JM and Azzi A. The 80th anniversary of vitamin E: beyond its antioxidant properties. *Biol Chem* 2002;383, 457-465.
11. Arthur JR, Nicol F and Beckett GJ. Selenium deficiency, thyroid hormone metabolism, and thyroid hormone deiodinases. *Am J Clin Nutr* 1993;57, 236S-239S.
12. Arthur JR, Nicol F, et al. Impairment of iodothyronine 5'-deiodinase activity in brown adipose tissue and its acute stimulation by cold in selenium deficiency. *Can J Physiol Pharmacol* 1991;69, 782-785.
13. van den Brandt PA, Goldbohm RA, et al. A prospective cohort study on toenail selenium levels and risk of gastrointestinal cancer. *J Natl Cancer Inst* 1993;85, 224-229.
14. Yamada M and Mori M. Mechanisms related to the pathophysiology and management of central hypothyroidism. *Nat Clin Pract Endocrinol Metab* 2008;4, 683-694.
15. Beckett GJ, Nicol F, et al. Effects of combined iodine and selenium deficiency on thyroid hormone metabolism in rats. *Am J Clin Nutr* 1993;57, 240S-243S.
16. Tripkovic L, Lambert H, et al. Comparison of vitamin D2 and vitamin D3 supplementation in raising serum 25-hydroxyvitamin D status: a systematic review and meta-analysis. *Am J Clin Nutr* 2012;95, 1357-1364.
17. Giovannucci E, Liu Y, et al. Prospective study of predictors of vitamin D status and cancer incidence and mortality in men. *J Natl Cancer Inst* 2006;98, 451-459.
18. Lee W and Kang PM. Vitamin D deficiency and cardiovascular disease: Is there a role for vitamin D therapy in heart failure? *Curr Opin Investig Drugs* 2014;11, 309-314.
19. Salehpour A, Hosseini F, et al. A 12-week double-blind randomized clinical trial of vitamin D(3) supplementation on body fat mass in healthy overweight and obese women. *Nutr J* 2014;11, 78.
20. Pereira-Santos M, Costa PR, et al. Obesity and vitamin D deficiency: a systematic review and meta-analysis. *Obes Rev* 2015.
21. Marcotricho J, Tourniaire F, et al. Vitamin D protects against diet-induced obesity by enhancing fatty acid oxidation. *J Nutr Biochem* 2014;25, 1077-1083.
22. Yoneshiro T, Aita S, et al. Nonpungent capsaicin analogs (capsinoids) increase energy expenditure through the activation of brown adipose tissue in humans. *Am J Clin Nutr* 2012;95, 845-850.
23. Saito M and Yoneshiro T. Capsinoids and related food ingredients activating brown fat thermogenesis and reducing body fat in humans. *Curr Opin Lipidol* 2013;24, 71-77.
24. Whiting S, Derbyshire E and Tiwari BK. Capsaicinoids and capsinoids. A potential role for weight management? A systematic review of the evidence. *Appetite* 2012;59, 341-348.
25. Ludy MJ, Moore GE and Mattes RD. The effects of capsaicin and capsiate on energy balance: critical review and meta-analyses of studies in humans. *Chem Senses* 2012;37, 103-121.
26. Yoneshiro T and Saito M. Transient receptor potential activated brown fat thermogenesis as a target of food ingredients for obesity management. *Curr Opin Clin Nutr Metab Care* 2013;16, 625-631.
27. McNamara FN, Randall A and Gunthorpe MJ. Effects of piperine, the pungent component of black pepper, at the human vanilloid receptor (TRPV1). *Br J Pharmacol* 2005;144, 781-790.
28. Jwa H, Choi Y, et al. Piperine, an LXRalpha antagonist, protects against hepatic steatosis and improves insulin signaling in mice fed a high-fat diet. *Biochem Pharmacol* 2012;84, 1501-1510.
29. Mansour MS, Ni YM, et al. Ginger consumption enhances the thermic effect of food and promotes feelings of satiety without affecting metabolic and hormonal parameters in overweight men: a pilot study. *Metabolism* 2012;61, 1347-1352.
30. Kim MJ, Son HJ, et al. The TRPA1 agonist, methyl syringate suppresses food intake and gastric emptying. *PLoS One* 2012; 8, e71603.
31. Hung LM, Chen JK, et al. Cardioprotective effect of resveratrol, a natural antioxidant derived from grapes. *Cardiovasc Res* 2000;47, 549-555.
32. Rahal K, Schmiedlin-Ren P, et al. Resveratrol has antiinflammatory and antifibrotic effects in the peptidoglycan-polysaccharide rat model of Crohn's disease. *Inflamm Bowel Dis* 2012;18, 613-623.
33. Alberdi G, Rodriguez VM, et al. Thermogenesis is involved in the body-fat lowering effects of resveratrol in rats. *Food Chem* 2013;141, 1530-1535.
34. Baur JA, Pearson KJ, et al. Resveratrol improves health and survival of mice on a high-calorie diet. *Nature* 2006;444, 337-342.
35. Oi-Kano Y, Kawada T, et al. Oleuropein, a phenolic compound in extra virgin olive oil, increases uncoupling protein 1 content in brown adipose tissue and enhances noradrenaline and adrenaline secretions in rats. *J Nutr Sci Vitaminol (Tokyo)* 2008;54, 363-370.
36. da-Silva WS, Harney JW, et al. The small polyphenolic molecule kaempferol increases cellular energy expenditure and thyroid hormone activation. *Diabetes* 2007;56, 767-776.
37. Sharma RA, Gescher AJ and Steward WP. Curcumin: the story so far. *Eur J Cancer* 2005;41, 1955-1968.
38. Aggarwal BB, Sundaram C, et al. Curcumin: the Indian solid gold. *Adv Exp Med Biol* 2007;595, 1-75.
39. Abe Y, Hashimoto S and Horie T. Curcumin inhibition of inflammatory cytokine production by human peripheral blood monocytes and alveolar macrophages. *Pharmacol Res* 1999;39, 41-47.
40. Kawanishi S, Oikawa S and Murata M. Evaluation for safety of antioxidant chemopreventive agents. *Antioxid Redox Signal* 2005;7, 1728-1739.
41. Jager S, Trojan H, et al. Pentacyclic triterpene distribution in various plants - rich sources for a new group of multi-potent plant extracts. *Molecules* 2009;14, 2016-2031.
42. Kunkel SD, Elmore CJ, et al. Ursolic acid increases skeletal muscle and brown fat and decreases diet-induced obesity, glucose intolerance and fatty liver disease. *PLoS One* 2012;7, e39332.
43. Zhang Z, Zhang H, et al. Berberine activates thermogenesis in white and brown adipose tissue. *Nat Commun* 2014;5, 5493.
44. Lee YS, Kim WS, et al. Berberine, a natural plant product, activates AMP-activated protein kinase with beneficial metabolic effects in diabetic and insulin-resistant states. *Diabetes* 2006;55, 2256-2264.
45. Andrews M, Soto N and Arredondo-Olguin M. Association between ferritin and hepcidin levels and inflammatory status in patients with type 2 diabetes mellitus and obesity. *Nutrition* 2015;31, 51-57.
46. Iwasaki T, Nakajima A, et al. Serum ferritin is associated with visceral fat area and subcutaneous fat area. *Diabetes Care* 2005;28, 2486-2491.
47. Jiang R, Manson JE, et al. Body iron stores in relation to risk of type 2 diabetes in apparently healthy women. *Jama* 2004;291, 711-717.
48. Brewer GJ. Alzheimer's disease causation by copper toxicity and treatment with zinc. *Front Aging Neurosci* 2014;6, 92.
49. MacDonald G, Nalvarle I, et al. Memo is a copper-dependent redox protein with an essential role in migration and metastasis. *Sci Signal* 2014;7, ra56.
50. Jimenez-Jimenez FJ, Molina JA, et al. Cerebrospinal fluid levels of transition metals in patients with Parkinson's disease. *J Neural Transm* 1998;105, 497-505.
51. Takagi Y, Okada A, et al. Evaluation of indexes of in vivo manganese status and the optimal intravenous dose for adult patients undergoing home parenteral nutrition. *Am J Clin Nutr* 2002;75, 112-118.
52. Hozumi I, Hasegawa T, et al. Patterns of levels of biological metals in CSF differ among neurodegenerative diseases. *J Neurol Sci* 2011;303, 95-99.
53. Sidoryk-Wegrynowicz M and Aschner M. Manganese toxicity in the central nervous system: the glutamine/glutamate-gamma-aminobutyric acid cycle. *J Intern Med* 2013;273, 466-477.
54. Brady DC, Crowe MS, et al. Copper is required for oncogenic BRAF signalling and tumorigenesis. *Nature* 2014;509, 492-496.
55. Larsson SC. Are calcium supplements harmful to cardiovascular disease? *JAMA Intern Med* 2013;173, 647-648.
56. Reid IR. Should we prescribe calcium supplements for osteoporosis prevention? *J Bone Metab* 2014;21, 21-28.
57. Bolland MJ, Avenell A, et al. Effect of calcium supplements on risk of myocardial infarction and cardiovascular events: meta-analysis. *BMJ* 2010;341, c3691.



# The Anti-Inflammatory Diet

## LOSE YOUR GUT AND STAY HEALTHY FOREVER

Chronic low-grade inflammation, the kind that simmers inside your body without any obvious warning signs, is slowly damaging your tissues and may be contributing to the development of several chronic diseases including heart disease, type 2 diabetes, cancer and neurodegenerative disorders including Parkinson's, Alzheimer's and Huntington's disease. Inflammation is also the underlying cause of autoimmune diseases.

Soon after you bruise or cut yourself, your immune system runs to the rescue by increasing blood flow, and delivering fluids, proteins and white blood cells to the injured area, resulting in swelling and redness. This acute inflammatory response is an essential part of the healing process that helps protect the site from infection and further injury. Chronic low-grade inflammation, on the other hand, is like a fire that is constantly burning inside

your body, overloading your immune system, putting it in constant fight mode. Because this type of inflammation is harmful rather than helpful, taming it by losing excess body fat, eating an anti-inflammatory diet and doing the right type of physical activity will improve your health and could decrease your risk of developing several diseases.

### EXCESS BODY FAT AND THE WAR WITHIN

Fat is an active tissue, constantly pumping out substances that influence your appetite, metabolic rate, immune system and blood glucose levels. Several of these substances also increase inflammation.

People with excess fat, particularly visceral fat, the kind that hugs your organs like bubble wrap and is considered very harmful for heart health, have even more pro-inflammatory

compounds being pumped out of their fat tissue, creating a vicious domino effect where the excess fat leads to elevated levels of inflammatory substances that create additional damage. Losing excess fat, particularly belly fat, will lower inflammation and improve health and decrease risk for disease, particularly heart disease, the number one cause of death in both men and women in the U.S.

### DIET 911 FOR FIGHTING INFLAMMATION

In general, diets high in sugar, saturated fat, fried foods and foods cooked on high, dry heat contribute to inflammation. When you grill, broil, roast or fry meat, poultry, pork or fish, a number of nasty compounds are formed. As a result, your plate is full of pro-inflammatory heterocyclic amines (HCAs), polycyclic aromatic hydrocarbons (PAHs) and advanced glycation end products (AGEs) that may be damaging the cells inside your body. According to the National Cancer Institute (NCI), HCAs and PAHs must be metabolized by specific enzymes (a process called bio-activation) before they can damage DNA. Yet the activity of these enzymes varies between people and therefore, one's risk of developing cancer due to HCA and PAH exposure depends on how they metabolize these compounds. AGEs accumulate in the human body, affect cell functioning and may contribute to insulin resistance, type 2 diabetes and, as the name implies, aging. Think of them as compounds that literally age your body.

To decrease your exposure to these compounds, turn down the heat, opt for moist heat cooking methods including poaching, steaming, stewing or boiling, cook your food for a shorter period of time, avoid smoked meats and marinate your meat, poultry, pork and fish in acidic ingredients such as lemon juice or vinegar. Also, add herbs and spices to your foods whenever possible to help decrease the formation of HCAs and malondialdehyde



***Chronic low-grade inflammation, like a fire that is constantly burning inside your body, overloading your immune system.***



(MDA)—a compound produced in greater quantities in meat cooked on low versus high heat and one that is also produced in your body when you digest fat. MDA increases inflammation and oxidative damage to tissues including cartilage and LDL cholesterol. Oxidized LDL contributes to atherosclerosis, the formation of plaque in arteries (gunk that clogs them) impairing blood flow to organs. Atherosclerosis can affect arteries throughout the body, including the heart, brain, arms, legs, pelvis and kidneys, and therefore cause chronic kidney disease, peripheral arterial disease, carotid artery disease and coronary heart disease.

## SPICE THINGS UP

Herbs and spices preserve and lend flavor to food without the addition of fat, sugar or salt. Composed of a complex mix of antioxidants, healthy plant-based compounds called phytochemicals (plant chemicals), vitamins and minerals, herbs and spices also protect your body from harm and may help kill germs.

Herbs and spices seem to fight inflammation throughout the body. For instance, when consumed in doses ranging from 30–500 milligrams over a three- to six-week period, ginger reduced osteoarthritis pain in adults. Osteoarthritis is an inflammatory condition often characterized by pain and stiffness in joints due to the breakdown of cartilage that cushions joints. Also, research shows that 2 grams of either raw or heat-treated ginger taken before a tough bout of exercise decreased pain and inflammation 24 hours after the exercise in college-aged students. Plus, a study in men found that a mixture of spices including cloves, cinnamon, oregano, ginger, black pepper, paprika and garlic, decreased formation of MDA (as measured by blood and urinary MDA in the study subjects).

Though widely recommended for its anti-inflammatory activity, curcumin, a group of compounds found in the spice turmeric, is poorly absorbed. And therefore, a sprinkle of turmeric won't do much. When taken in much larger doses (3.6 grams), curcumin is detectable in the body. Luckily it is considered safe when taken in supplemental doses of up to 8 grams per day.

## VITAMIN D

Vitamin D, found in fatty fish, fortified milk, some brands of yogurt and other fortified foods, may help decrease inflammation. Yet the connection between vitamin D and inflammation seems to be a cyclical pattern. Low levels of vitamin D may increase inflammation while inflammation may also lead to lower levels of vitamin D.

In an attempt to figure out how vitamin D may affect the inflammatory cascade, infection-fighting white blood cells were exposed

to a molecule found in the walls of bacterial cells that promotes an intense inflammatory response. Cells incubated in a solution with no vitamin D produced higher levels of inflammatory compounds than those exposed to vitamin D, suggesting vitamin D plays an important role in the immune and inflammatory response.

Newer research also suggests that low levels of vitamin D may not be the cause of but instead a consequence of inflammation. Given the complex relationship between vitamin D and inflammation, it makes sense to consume vitamin D-rich foods, get tested by your physician if you think you may be low (or if you have an inflammatory condition) and follow up with regular treatment.

## DIETARY PATTERNS MATTER

While scientists are busy trying to tease out single nutrients or compounds in foods that are linked to lower or higher levels of inflammation, dietary patterns that promote good health may explain the synergistic effect of a combination of healthy foods.

The Mediterranean diet is a perfect example of a dietary pattern that is rich in vitamins, minerals and healthy plant-based compounds due to its emphasis on plant-based foods, such as vegetables, fruits, whole grains, legumes and nuts, spices and herbs for flavor. Compounds consumed in high quantities when following this diet reduce circulating levels of inflammatory compounds. In addition, the Mediterranean diet is associated with increased telomere length—longer telomeres are associated with decreased aging. Plus, populations that follow the Mediterranean diet have a reduced risk of death from heart disease and cancer and a lower incidence of some neurodegenerative diseases. Yet this pattern of eating isn't the only one associated with improvements in inflammation and disease risk.

The Nordic Diet is largely composed of whole grains, berries, fruits, vegetables, rapeseed oil, three servings of fish per week and low-fat dairy products. In one randomized trial, overweight and obese middle-aged adults with at least two risk factors for heart disease or diabetes followed the Nordic Diet or their regular diet for 18 to 24 weeks. After the study period, researchers found neither group lost weight yet the Nordic Diet significantly altered the expression of inflammatory genes in subcutaneous fat—the kind that lies right underneath the skin, which suggest the benefits of this diet aren't the result of losing fat (which has its own direct effect on decreasing inflammation).

## GET MOVING AND RAMP UP THE INTENSITY

Exercise, regardless of whether it helps a person lose weight or not, will lower chronic

inflammation. In fact, those who make exercise a lifestyle habit will reduce inflammation. And though muscle-building resistance training does not appear to influence chronic inflammation, aerobic exercise, particularly higher intensity aerobic exercise (75–80% of maximal heart rate), improves inflammatory status.

If you are looking at foods based solely on their fat, carbohydrate and protein content, it's time to dig deeper and consider not only your food choices, but how you marinate or season and cook them and what you pair them with. A good rule of thumb for lowering inflammation, belly fat and disease risk: flavor your meals with herbs and spices, ramp up your intake of vitamin D-rich foods, consume colorful plant-based compounds at every meal and get moving and stay moving. ■

## REFERENCES

- Buresh R, Berg K. Role of exercise on inflammation and chronic disease. *Strength Cond J* 2014;36(4):87–9
- Kolehmainen M, Ulven SM, Paananen J, et al. Healthy Nordic diet downregulates the expression of genes involved in inflammation in subcutaneous adipose tissue in individuals with features of the metabolic syndrome. *Am J Clin Nutr* 2015;101(1):228–39.
- Poulsen SK, Due A, Jordy AB, Kiens et al. Health effect of the New Nordic Diet in adults with increased waist circumference: a 6-mo randomized controlled trial. *Am J Clin Nutr* 2014;99(1):35–45.
- Katcher HI, Legro RS, Kunselman AR et al. The effects of a whole grain-enriched hypocaloric diet on cardiovascular disease risk factors in men and women with metabolic syndrome. *Am J Clin Nutr* 2008;87:79–90.
- Chemicals in Meat Cooked at High Temperatures and Cancer Risk. National Cancer Institute. <http://www.cancer.gov/cancertopics/factsheet/Risk/cooked-meats#19>
- Safer Grilling Methods Might Cut Cancer Risk. *Medline Plus*. [http://www.qa.nlm.nih.gov/medlineplus/270/news/fullstory\\_126369.html](http://www.qa.nlm.nih.gov/medlineplus/270/news/fullstory_126369.html)
- Santarelli RL, Pierre F, Corpet DE. Processed meat and colorectal cancer: a review of epidemiologic and experimental evidence. *Nutr Cancer* 2008;60(2):131–144.
- Herber D. Oxidative stress markers and inflammation: the role of spices and herbs. *McCormick Science Institute science summit – spices and herbs*. AGEs accumulate in the human body, affect cell functioning and may contribute to insulin resistance, type 2 diabetes and, as the name implies, aging.
- Alshaarawy O, Zhu M, Ducatman A et al. Polycyclic aromatic hydrocarbon biomarkers and serum markers of inflammation. A positive association that is more evident in men. *Env Res* 2013;98:104.
- Asthma. *MedlinePlus*. NIH Publication 08-4051
- Prasad C, Imrhan V, Marotta F et al. Lifestyle and Advanced Glycation End Products (AGEs) Burden: Its Relevance to Healthy Aging. *Aging Dis* 2014;5(3):212–217.
- Brown ED, Morris VC, Rhodes DG, Sinha R, Levander OA. Urinary malondialdehyde-equivalents during ingestion of meat cooked at high or low temperatures. *Lipids* 1995;30(11):1053–6.
- Tanaga KI, Bujo H, Inoue M, Mikami K, Kotani K, Takahashi K, Kanno T, Saito Y. Increased circulating malondialdehyde-modified LDL levels in patients with coronary artery diseases and their association with peak sizes of LDL particles. *Arterioscler Thromb Vasc Biol* 2002;22(4):662–6
- What is Atherosclerosis? National Heart, Lung, and Blood Institute. <http://www.nhlbi.nih.gov/health/health-topics/topics/atherosclerosis>
- Li Z, Henning SM, Zhang Y et al. Antioxidant-rich spice added to hamburger meat during cooking results in reduced meat, plasma, and urine malondialdehyde concentrations. *Am J Clin Nutr* 2010;91(5):1180–1184.
- Mangin M, Sinha R, Fincher K. Inflammation and vitamin D: the infection connection. *Inflamm Res* 2014;63(10):803–19.



# GLUTAMINE DILEMMA: *IMMUNE ENHANCER?* *mTOR ANTAGONIST?*

The amino acid glutamine is one of 11 nonessential amino acids found in the body. It is also one of the 20 amino acids used to biosynthesize protein molecules, and is one of the few amino acids that can directly cross the blood-brain barrier.<sup>1</sup> Glutamine is primarily found circulating in the blood and stored within muscle tissue. It becomes conditionally essential, requiring intake from food or supplements, in states of illness or injury.<sup>2</sup>

Glutamine has become a popular nutritional supplement because of its alleged positive influence on muscle growth and the immune system. However, despite the fact that glutamine has a physiological role in the anabolic process of muscle growth and modulation of the immune system, especially during intense exercise, dietary supplementation with glutamine apparently has no definitive ergogenic benefit on muscle growth or immune system function—especially in healthy, well-nourished individuals.

## GLUTAMINE INHIBITS mTOR, LIKELY REDUCING MUSCLE GROWTH

Certain amino acids modulate the activity of the muscle-building enzyme mTOR, ultimately playing a key role in the anabolic process of muscle protein accretion. The intake of essential amino acids, especially during the recovery period after exercise, promotes amino acid uptake into muscle—increasing the rate of protein synthesis while decreasing the rate of protein breakdown, ultimately resulting in muscle protein accumulation and muscle growth.

One of these essential amino acids, the branched-chain amino acid leucine, is the most effective at activating mTOR and inhibiting muscle protein breakdown while increasing muscle protein synthesis.<sup>3,4</sup> By contrast, glutamine has been shown to actually inactivate mTOR function in isolated muscle cells, conceivably reducing muscle growth.<sup>5</sup> Glutamine's influence on mTOR function was observed despite the fact that no decrease in protein synthesis was shown in this study after glutamine exposure, even though mTOR



**SUPPLEMENTING WITH GLUTAMINE IS UNLIKELY TO PROVIDE AN ANABOLIC ADVANTAGE.**

was inactivated. The authors of the study propose that this unexpected influence on protein synthesis is due to the experiments being carried out on isolated muscle cells that were in a certain growth phase that perturbed protein translation rates within the cell, ultimately skewing the results. Nonetheless, the results of this study still demonstrate that supplementing with glutamine is unlikely to provide an anabolic advantage.

## GLUTAMINE DOESN'T PROMOTE STRENGTH, EITHER

In addition to the apparent inability of glutamine to trigger muscle growth, glutamine is also evidently incapable of increasing strength. A study by Candow et al.<sup>6</sup> showed that supplementing with glutamine for six weeks while strength training resulted in no change in strength and no additional gain in muscle mass, when compared with strength training done without glutamine supplementation.



Furthermore, other studies investigating the impact of glutamine on endurance strength showed no positive impact from glutamine intake. In one of these studies, glutamine supplementation one hour after exercise was ineffective at increasing the number of repetitions performed on the leg press or bench press.<sup>7</sup> The previously mentioned study by Candow et al.<sup>8</sup> also showed no increase in training volume after supplementing with glutamine and resistance training for six weeks relative to the placebo group. Altogether, these studies show that glutamine supplementation fails to consistently demonstrate any positive ergogenic benefit on strength or strength endurance.

## GLUTAMINE, THE IMMUNE ENHANCER?

Glutamine directly supports the proliferation of immunological cells known as lymphocytes. Glutamine also provides energy to these cells, altogether making glutamine essential for lymphocyte survival.<sup>8</sup> Unlike muscle tissue, lymphocytes cannot synthesize glutamine. So, they are largely dependent on muscle as a glutamine source. Extensive exercise is associated with a decrease in glutamine levels in the body, generating the hypothesis that an exercise-induced decrease in glutamine could reduce lymphocyte performance, impairing function of the immune system.<sup>9</sup>

A positive relationship between strenuous training and upper respiratory tract infections, indicating a weakened immune system, has been shown in several studies.<sup>10-12</sup> This relationship is most commonly attributed to changes in lymphocyte function after exercise, due to a reduction in glutamine levels. As a result, supplementation with glutamine has been proposed as a potential way to mitigate the negative impact of exercise on the immune system, resulting in fewer infections. However, there is a considerable amount of scientific evidence showing no consistent effect of glutamine supplementation on incidence of upper respiratory tract infections after exercise.<sup>13</sup>

Furthermore, additional studies suggest that glutamine supplementation has no detectable effect on exercise-induced changes of the immune system. In one study showing this effect, Rohde et al.<sup>14</sup> had subjects exercise at 75 percent of their maximum capacity for 30, 45 and

60 minutes, with two-hour rests between each session. Subjects were fed glutamine 30 minutes before and after exercise. The results of the study showed that despite the ability of glutamine supplementation to prevent the fall of plasma glutamine levels, it did not prevent the decline in lymphocyte proliferation. In addition, several other studies have also shown that glutamine supplementation that prevents a reduction in plasma glutamine levels from intense exercise did not prevent a reduction in immune system activity.<sup>15</sup>

While the vast majority of studies show no influence from glutamine supplementation on immunity, only one study by Castell et al.<sup>16</sup> has been able to provide evidence that glutamine supplementation mitigates the occurrence of upper respiratory infections in runners. In this study, ultra-marathon and marathon runners were given either five grams of glutamine or a placebo immediately after running. The runners ingesting glutamine self-reported a lower occurrence of upper respiratory tract infections relative to the placebo group. However, it is unlikely that the glutamine dose used in this study was high enough to prevent a decline in plasma glutamine. This hypothesis is based on another report that showed supplementation with five grams of glutamine resulted in a decline in plasma glutamine levels similar to the placebo group immediately after intense exercise<sup>17</sup>, which indicates that doses in excess of five grams need to be ingested to sustain plasma glutamine concentrations several hours post exercise. ■

For most of Michael Rudolph's career he has been engrossed in the exercise world as either an athlete (he played college football at Hofstra University), personal trainer or as a research scientist (he earned a B.Sc. in Exercise Science at Hofstra University and a Ph.D. in Biochemistry and Molecular Biology from Stony Brook University). After earning his Ph.D., Michael investigated the molecular biology of exercise as a fellow at Harvard Medical School and Columbia University for over eight years. That research contributed seminally to understanding the function of the incredibly important cellular energy sensor AMPK—leading to numerous publications in peer-reviewed journals including the journal *Nature*. Michael is currently a scientist working at the New York Structural Biology Center doing contract work for the Department of Defense on a project involving national security.

## REFERENCES

1. Lee WL, Hawkins RA, et al. Glutamine transport by the blood-brain barrier: a possible mechanism for nitrogen removal. *Am J Physiol* 1998;274, C1101-1107.
2. Buchman AL. Glutamine: commercially essential or conditionally essential? A critical appraisal of the human data. *Am J Clin Nutr* 2001;74, 25-32.
3. Manders RJ, Koopman R, et al. The muscle protein synthetic response to carbohydrate and protein ingestion is not impaired in men with longstanding type 2 diabetes. *J Nutr* 2008;138, 1079-1085.
4. Walker DK, Dickinson JM, et al. Exercise, amino acids, and aging in the control of human muscle protein synthesis. *Med Sci Sports Exerc* 2011;43, 2249-2258.
5. Deldicque L, Sanchez Canedo C, et al. Antagonistic effects of leucine and glutamine on the mTOR pathway in myogenic C2C12 cells. *Amino Acids* 2008;35, 147-155.
6. Candow DG, Chilibeck PD, et al. Effect of glutamine supplementation combined with resistance training in young adults. *Eur J Appl Physiol* 2001;86, 142-149.
7. Antonio J, Sanders MS, et al. The effects of high-dose glutamine ingestion on weightlifting performance. *J Strength Cond Res* 2002;16, 157-160.
8. Ardawi MS and Newsholme EA. Glutamine metabolism in lymphocytes of the rat. *Biochem J* 1983;212, 835-842.
9. Parry-Billings M, Budgett R, et al. Plasma amino acid concentrations in the overtraining syndrome: possible effects on the immune system. *Med Sci Sports Exerc* 1992;24, 1353-1358.
10. Petibois C, Cazorla G, et al. Biochemical aspects of overtraining in endurance sports: a review. *Sports Med* 2002;32, 867-878.
11. Nieman DC and Bishop NC. Nutritional strategies to counter stress to the immune system in athletes, with special reference to football. *J Sports Sci* 2006;24, 763-772.
12. Nieman DC. (1997). Immune response to heavy exertion. *J Appl Physiol* 1985; 82, 1385-1394.
13. Moreira A, Kerkonen RA, et al. Nutritional modulation of exercise-induced immunodepression in athletes: a systematic review and meta-analysis. *Eur J Clin Nutr* 2007;61, 443-460.
14. Rohde T, MacLean DA and Pedersen BK. Effect of glutamine supplementation on changes in the immune system induced by repeated exercise. *Med Sci Sports Exerc* 1998;30, 856-862.
15. Krzykowski K, Petersen EW, et al. Effect of glutamine supplementation on exercise-induced changes in lymphocyte function. *Am J Physiol Cell Physiol* 2001;281, C1259-1265.
16. Castell LM, Poortmans JR and Newsholme EA. Does glutamine have a role in reducing infections in athletes? *Eur J Appl Physiol Occup Physiol* 1996;73, 488-490.
17. Castell LM and Newsholme EA. The effects of oral glutamine supplementation on athletes after prolonged, exhaustive exercise. *Nutrition* 1997;13, 738-742.



## TESTOSTERONE TABLETS

NO PRESCRIPTION REQUIRED TO ORDER

**REAL TESTOSTERONE**  
NOT A PRO-HORMONE OR INCREASER

WE SHIP QUICK 3 DAY DELIVERY FROM WITHIN USA NO CUSTOMS



**ONLY \$60.00**  
**Buy 2 Get 1 FREE**  
**3 Bottles \$120.00**

LEARN ABOUT OUR DISCOUNT REFILL PROGRAM

Used when trying to put on LEAN MASS or LOSE BODY FAT

**BUY REAL TESTOSTERONE!**  
Why buy just a herbal testosterone increaser?

**NO SIDE EFFECTS** were reported at normal dosages!  
Side effects only occurred with abuse.

**DOSEAGE:** 1-2 TABLETS DAILY WITH FOOD

**30 day supply ONLY \$60.00**  
**or 3 months ONLY \$120.00!**



**ALL PRODUCTS LEGAL IN USA FOR PERSONAL USE**

Check or Money Order send to:

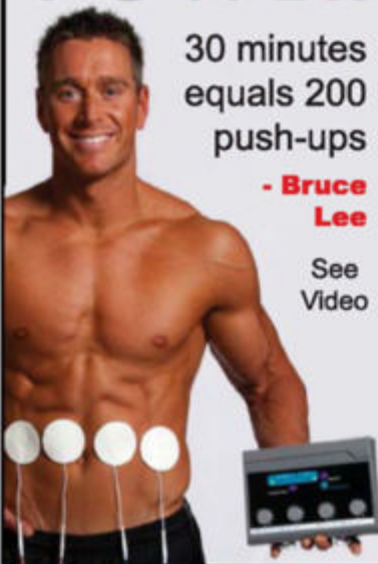
Testosterone Rx, 3465 S. Arlington Rd Suite E #157, Akron, OH 44312

ORDER COD or CREDIT CARD - "ORDER 24-7" TOLL FREE  
USA 1-866-607-2768 OR 1-216-990-3500

\$16.99 COD CHARGE

[www.TESTOSTERONERX.com](http://www.TESTOSTERONERX.com)

## REAL EMS POWER



30 minutes  
equals 200  
push-ups

- **Bruce Lee**

See  
Video

**800-573-8171**

[www.StimRX.com](http://www.StimRX.com)

Free AB Belt  
with Purchase Use Coupon Code  
MF514

## BUY LEGAL STEROIDS

### DEKKA



45 PILLS 1  
MONTH SUPPLY

Dekka contains the most popular legal steroid used in America today. Many report loss of body fat, lean mass, no bloating, good strength gains while still considered one of the safest anabolic compounds.

**ONLY \$60.00**  
**Buy 2 Get 1 FREE**  
**3 Bottles \$120.00**

### DIANOBOL

DIANOBOL IS GREAT FOR BULKING UP!  
Made for real world results muscle gain and strength gains. Implementing a purer version can be brought in without compromising the stability.



100 PILLS 1  
MONTH SUPPLY

**ONLY \$60.00**  
**Buy 2 Get 1 FREE**  
**3 Bottles \$120.00**

**ALL PRODUCTS LEGAL IN USA FOR PERSONAL USE**

COUNTERFEIT PROOF HOLOGRAM

Check or Money Order send to:  
ZOE LABS P.O. BOX #14 GREEN, OH 44332

\*ORDER COD or CREDIT CARD\*ORDER 24-7 TOLL FREE  
USA 1-866-607-2768 OR  
1-216-990-3500

Results may vary. These products are not intended to diagnose, treat, or prevent any disease. Dianabol does not combine the use of illegal anabolic steroids. Dianabol is a legal supplement not to be confused with Dianabol Ciba pharmaceutical drug of similar name. These products do not contain any illegal anabolic steroids.

[www.ZOELABS.com](http://www.ZOELABS.com)

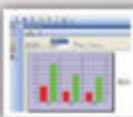
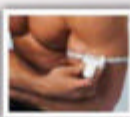


**UPGRADE YOUR ROUTINE  
AND GAIN THE  
POWER THREE  
ADVANTAGE**

## FatTrack® GOLD PREMIUM

**BODY FAT MANAGEMENT TOOLS  
PACKAGED TOGETHER FOR YOUR SUCCESS!**

MEASURE IT • RECORD IT • CHART IT • PICTURE IT



Updated FatTrack® II / MyoTape® / Body Tracker Software

[www.accufitness.com](http://www.accufitness.com) or call 800-866-2727

Also  
Available  
At:

GNC LiveWell

MyoTape

netwix.com

## SEXY LIVE TALK

**\$12** Per Call

No Start Up Fees!  
No BS!

Just Plenty  
of  
**SEXY Babes!**

**1-800-615-6869**

Visa / MC / Amex 18+




**get  
history  
buff.  
loc.gov**



The LIBRARY of CONGRESS







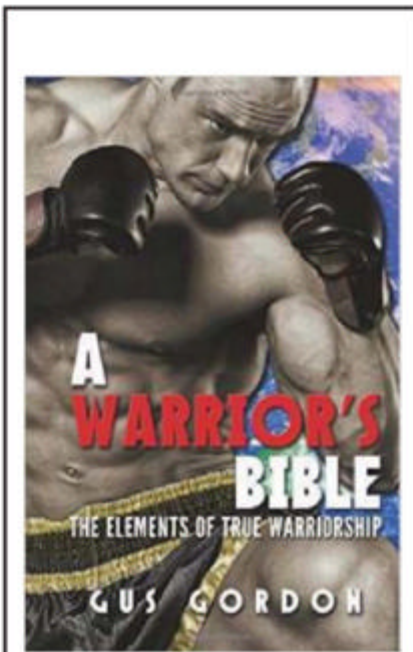
# NITROCUT®

**ORDER TODAY & DOWNLOAD FITNESS E-BOOK**

**BETTER RESULTS**

**CALL : 888 666 7715**

**WWW.NITROCUT.COM**



# A WARRIOR'S BIBLE

THE ELEMENTS OF TRUE WARRIDSHIP

GUS GORDON

**Available on Amazon.com**



**www.legalpeptides.com**

# HOT to Have

HOTtoHave.com (800) 825-2461

**Meet HOT Locals FREE to Reply!**  
888-634-2628 FREE Code 3231

**ASIAN BRIDES! OVERSEAS!** Penpals, romance!  
Free Brochure. P.O. BOX 4601-FM, THOUSAND OAKS, CA 91359 **www.pacis.com** 805-492-8040

**Inspirational athletic jewelry for the fitness driven man!**  
Necklaces, Dog tags, Key chains and much more at our site. Never Stop. Never Surrender.  
20% off with Coupon Code RK20  
**www.competitor4life.com**

# CAN YOU HAVE PERMANENT OR ENLARGEMENT FOR A LIFETIME?

Dr. Bross advises erection size can be 3 inches bigger and can have enlargement for a lifetime when you continue to take PRO+PLUS PILLS. Size can be bigger in less than 40 days. Special 360 days prices. Choose Original, Advanced or Ultimate.

**PRO+PLUS LQ ACCELERATOR LIQUID**  
Works with any Pro+Plus Pills.  
**FREE WITH ANY 360 DAYS SUPPLY OF PRO+PLUS PILLS**

**PRO+PLUS XTREME**  
For Immediate Erections.  
Effective Up To 12 Hours.  
**FREE BOTTLE WITH ANY PRO+PLUS FORMULA**

**PRO+PLUS MYTMAX**  
TESTOSTERONE BOOSTER  
Increases Sex Drive and Performance.

**What a difference 3" makes. REACH YOUR MAXIMUM POTENTIAL. MONEY BACK GUARANTEE**

**CALL TOLL FREE ANYTIME**  
Se Habla Español  
**1-800-378-4689**  
1-818-342-2028 9 am-5 pm PST (M-F)  
**www.ProPlusMedical.com**  
**www.AvidProMedical.com**

**SEND ORDER FORM AND PAYMENT TO:**  
AVID PRO MEDICAL, dept. 55F5A  
18720 Oxnard St., Suite 103  
Tarzana, CA. 91356

**Phone & Internet Orders specify products and dept. code (shown left, next to company name).**

**QUANTITY**  
60 Days Supply  
120 Days Supply  
240 Days Supply  
360 Days Supply

**Original**  
For men who are now 5 inches or more.  
\$45  
\$80  
\$110  
\$150

**Advanced**  
For the men with a size less than average.  
\$60  
\$90  
\$130  
\$170

**Ultimate**  
For men with any size penis. Does Not Contain Yohimbe And L-Arginine.  
\$80  
\$140  
\$200  
\$240

**PRO+PLUS XTREME** **FREE BOTTLE WITH ANY PRO+PLUS FORMULA**  
1 Bottle (8 Capsules) \$14.95 **FREE**  
1 Bottle 48 Capsules \$40.75 **FREE**

**PRO+PLUS LQ ACCELERATOR LIQUID** **FREE WITH ANY 360 DAYS SUPPLY OF PRO+PLUS PILLS**  
1 Bottle \$25.00 each **FREE**

**Super Performance** Select ONE **FREE** With Any Pro+Plus Pills Order!  
Three Free With Any 360 Days Supply Of Pro+Plus Pills

Sexciter Liquid to Excite Women \$25.00 each **FREE**  
Attract-A-Mate to Attract Women \$25.00 each **FREE**  
Perform Enhancement Cream \$25.00 each **FREE**

**TOTAL PURCHASE:** \$  
CA Residents add 9% sales tax: \$  
Shipping, Rush Service and Insurance \$20.00 VALUE ONLY \$14.95  
**TOTAL ENCLOSURE OR CHARGE:** \$

**EXPRESS:** Month/Year **DVS CODE:** 3-digit Code on back of card or 4-digit on front of Avid

**NAME (print):** I am over 18 and agree to the terms of advertisement card

**ADDRESS:**

**CITY/STATE/ZIP:**

**EMAIL ADDRESS (optional):** **PHONE NUMBER (optional):**

Orders discreetly shipped with UPS or Priority Mail. Foreign Orders - Add \$25.00 S&H.  
COPYRIGHT ©1996 PRO+PLUS is a trade name of Avid Pro Medical. Individual results may vary. These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure or prevent any disease.

# ANABOLICS

#1 in Safe-Legal Gear!

# MUSCLE LABS USA

**www.MuscleLabsUSA.com**  
24/7 Call 1-727-210-5351

# LegalSteroidsUSA.com

**MUSCLE BUILDERS  
WEIGHT GAINERS  
FAT BURNERS  
ANABOLICS**

**CALL 1-800-441-1284**  
**Shop All The Best Brands!**  
**www.OrderLegalSteroids.com**



# GREG PLITT

## He Turned the Fitness World Upside Down

If you are a fan of fitness icon Greg Plitt and his column here in *FitnessRx*, you are probably aware that on January 17, 2015, which was shortly before we began work on this issue, Greg Plitt was killed when he was struck by a train in Burbank, California. He was just 37 years old.

As managing editor, I worked with Greg on his column every other month. He was always full of ideas, and was excited and eager to be a part of *FitnessRx* (he appeared on 10 covers—more than anyone in history). So it was strange to get started on this current issue and realize that there wouldn't be anymore friendly phone call/email exchanges with Greg about his column and upcoming photo shoots—strange to think that no new article would ever come, and that there

would be no more photo shoots to plan. We all miss Greg deeply here at *FitnessRx*.

But instead of focusing on the sadness, let's take a moment to remember some of the great advice that Greg offered in this column "Get Fit with Plitt." In these pages, Greg taught us about working hard for what you want and never giving up no matter what. That's why I can't think of a much better tribute to Greg than to live life the way he did—with perseverance, positivity, going after what you want without making excuses, and making your dreams come true.

To view our free special digital issue tribute to Greg, visit <http://fitnessrxformen.com/from-the-editors-desk/special-digital-issue-greg-plitt>. —Lisa Steuer, Managing Editor

### On cardio:

"I take all my concerns, stresses, and worries and upload them in my head, and at the end of the day when the work's done, I run the streets around my house and work through any issues, worries, plan the next day's missions, play out what I want to happen, etc. I find that doing cardio and thinking of your problem provides quicker solutions than if you sat in a chair brainstorming." January 2014

### On supplements:

"I think the most important supplements are rest, sleep and natural intensity." July 2014

### On morning workouts:

"I get to the gym at 5:30 a.m. and train each day because I know I always have that time free in the week and usually nothing prevents me from sticking to that schedule. At first, my body was sleepy when I started training that early, but after a few weeks, my body thirsted for the early workout and after leaving the gym to go to work, I was faster, quicker, mentally more alert than any of my co-workers were." March 2014

### On working through plateaus:

"I change my workout every time. Your body grows when it's forced to adapt to new situations it's not ready for. When it is adapting, it gets stronger to overcome the changes, which ultimately leads to growth. Changing your workout is as simple as switching the routine, or doing dumbbells instead of barbells, or Hammer Strength and machines instead of free weights, or taking a day and doing only bodyweight. You could also do the same routine but go heavy (reps around 6-8) and then do the next workout with the same routine but go light (reps around 18-20). You don't have to reinvent the wheel—it's easy." March 2014

### On core training:

"I do core workouts at the end of each lifting session for about 10 to 15 minutes. Each time I do a core workout, I change up the muscle region I am stressing and whether I am working for size or endurance, ensuring I never do the same workout in a row. Favorite exercises: Ankles to the bar, hanging windshield wipers, inverted dead hang sit-ups, plate-loaded back extensions and ab wheel roll-outs." May 2014



### On eating clean:

"To give up a dream to enjoy what any common man can encounter through taste is a worthless endeavor for me. I would much rather sacrifice today for what I feel tomorrow's growth can become. The taste of food is not enough of a reward to override the high of victory, fulfilling your dreams and becoming what we know we can become." January 2015

### On reaching goals:

"Typically people sit around knowing they can be better. When you embark on a journey, you should know the value of the journey. When time on the job starts to get hard, welcome it—because you are already in an elite status that few can say they have ever experienced. ... Continue the journey you have started because the world needs more people who believe in themselves more than set-

ting for what most do. ... Be one of the few who not only talks the game, but also sees it through and creates a path for others." January 2015

### On dedication:

"Don't walk though life blindly; people far less than you with less potential and genetics have achieved far greater than you because they have a greater desire and perseverance to see it through." September 2014



**NEW**  
AVAILABLE AT  
**GNC**  
LIVE WELL

# Nutrition... the way nature intended



■ Plant-Based Meal Replacement

■ Organic Rice Protein

■ Vegan Protein Plus Weight Loss

■ Weight Loss Capsules

Nature's Food™ is total-body nutrition that helps you make the most of your healthy, active lifestyle. You watch what you put in your body. That's why Nature's Food™ features hand-selected, plant-based ingredients without preservatives, artificial sweeteners, genetically modified organisms, gluten or dairy. All of our protein products are made with nutrient-rich ingredients, including brown rice protein, and deliver mouthwatering flavor your taste buds and muscles will love. Nature's Food™ – inspired by nature, designed for you.

## It's What's Inside That Counts...

- ✓ Free of soy, gluten and dairy ingredients
- ✓ Plant-based, 100% vegan protein
- ✓ Non-GMO
- ✓ No preservatives, artificial flavors or artificial sweeteners
- ✓ No pea protein
- ✓ Great taste



#NATURESFOOD



# BEEF

## DOES A BODY GOOD

100%  
PURE BEEF

25g PROTEIN

0 FAT

0 SUGAR

0 LACTOSE



MHP's new IsoPrime 100% BEEF™ gives you all the anabolic muscle building benefits of pure beef without any fat, cholesterol, sugar, lactose or gluten. This hydrolyzed Beef Protein Isolate provides fast absorption, a higher concentration of amino acids than whey and is easy to digest. IsoPrime 100% BEEF is made from USDA inspected beef and is non-GMO, rSBT free and hormone free. Get the muscle building power of pure beef in a great tasting protein shake with MHP's IsoPrime 100% BEEF!



1.888.783.8844 • MHPSTRONG.com

Join Team MHP!



facebook.com/TeamMHP  
twitter: @MHPStrong  
instagram: mhpstrong

